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PROFESSOR OF PATHOLOGICAL CHEMISTRY IN THE UNIVERSITY OF LONDON AT UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL

I

It is scarcely possible to give a connected account of the present state of knowledge concerning the biochemistry of the thyroid gland without paying some attention to the historical development of the subject; since this development is not without its own intrinsic interest I shall devote a part of the first of my two lectures to a consideration of its more prominent features. Although, as will be seen, the problems connected with the thyroid which remain unsolved are numerous and important, the advance of knowledge even to its present stage affords a striking example of the manner in which independent lines of research by medical men, physiologists, and chemists may ultimately converge and in so doing may contribute to the solution of a biological problem.

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The first anatomical description of the thyroid was given by Wharton in 1656 and the physical characteristics of the organ suggested to this author various possibilities as to its function. The most obvious distinguishing feature of the thyroid is the presence of the peculiar viscous fluid or colloid with which the follicles of the gland are filled; this substance was regarded by Wharton as a lubricant for the trachea to which it was supposedly conveyed through special ducts. A second point which struck Wharton was that the gland was generally of a larger size in women; in the female sex in particular therefore he regarded it as fulfilling a cosmetic function in giving grace to the contour of the neck.

At a later date observers became impressed with the very liberal blood-supply of the thyroid, and consideration of this led to a theory which held the field for some time—namely, that the thyroid acted as a vascular shunt and thus regulated the supply of blood to the brain. Here again the larger size of the gland in women was adduced in support of the argument, for Rush of New York wrote in 1820: "this provision was necessary to guard the female system from the influence of the more numerous causes of irritation and vexation of mind to which they are exposed than the male sex." An amusing reply to the ingenious suggestion of Rush was made by Hofrichter (1820). "If," he says, "it were indeed true that the thyroid contains more blood at some times than at others, this effect would be visible to the naked eye; in this case women would certainly have long ceased to go about with bare necks, for husbands would have learnt to recognise the swelling of this gland as a danger signal of threatening trouble from their better halves."

From time to time other suggestions with regard to the thyroid were advanced, as for instance that it was the organ of sleep and that it was essential for normal voice production, but all these hypotheses fell to the ground sooner or later for lack of objective support, with the result that as lately as fifty years ago the general belief of physiologists was that the thyroid, in the adult at least, performed no essential function whatever. The evidence which was needed finally to change this conception and to lay the foundations of modern knowledge of the thyroid came not from the physiologists, but from the medical men who had to deal with pathological conditions of the gland.

Essential Nature of the Thyroid

Goitre as an endemic disease had been recognised from very early times; mention of it occurs in the writings of Pliny and it is discussed by all the mediæval medical writers. As the name indicates goitre was first regarded merely as a swelling of the throat, but when the thyroid became recognised it was realised that it was this organ which was specifically affected in the disease. It was also gradually realised that endemic goitre was intimately associated in some way with the form of congenital idiocy which was known as cretinism.

In districts where goitre was endemic a very large proportion of the population was affected; in these regions the swelling of the neck came to be regarded as the normal state of affairs, and indeed there exist accounts of communities where there was rivalry between the inhabitants in the matter of the size and shape of their goitres and where visitors with normal necks were looked upon with pity as being deficient in one of the natural adornments of the human body. Whatever the cosmetic value of a goitre might be, however, there was no doubt that if the swelling reached an excessive size considerable discomfort and injury to health ensued; therapeutic measures had therefore to be devised to deal with the condition. I shall have occasion later to refer to the early medical treatment of the disease; at the moment I am concerned with the development of the technique for surgical removal of the swelling.

The usual surgical practice was to remove a part only of the goitre, but in some cases, where the pressure symptoms were very severe, total goitrectomy was effected, and it is to the careful study of a series of such cases published by Kocher in 1883 that we owe the first proof that the thyroid is indeed an essential organ. Kocher observed that whilst total goitrectomy effected, as was to be expected, a marked immediate improvement in the condition of his patients, their subsequent history was unsatisfactory. Some months after the operation a definite set of pathological symptoms began to appear; the skin became dry and thickened, the hair began to fall out, and the mental processes grew dull; in Kocher's own words the patients became "cretinartig"; they appeared to be relapsing into a condition analogous with that of the congenital idiots already mentioned as occurring frequently in areas of endemic goitre.

About ten years earlier there had been described by Gull a curious condition in middle-aged women which was characterised by a set of symptoms very similar to those which appeared in Kocher's patients; this condition was named by Ord (1878) myxœdema

* The Oliver-Sharpey lectures for 1935, delivered before the Royal College of Physicians of London on March 26th and 28th. Lect. II. will appear in a forthcoming issue.

and was definitely associated by him with atrophy of the thyroid gland. The brothers Reverdin (1883), who confirmed the observations of Kocher on the effects of total goitrectomy, noted the similarity of the post-operative condition of their patients with that of sufferers from myxœdema. It was also observed that removal of the thyroid from animals (especially young animals) produced certain changes which whilst not entirely similar to those present in human myxœdema were clearly analogous therewith.

The observations that the thyroid was an essential organ in man and animals and that its atrophy in the human being caused a definite disease led naturally to experiments on the treatment of this disease by a method of replacement. Schiff (1884) had obtained some evidence that the effects of thyroidectomy in animals could be relieved by grafting thyroid tissue and the first attempts to treat human myxœdema were made by this method (Bettencourt and Serrano, 1890); no permanent success was attained since the grafted tissue failed to establish itself, but the period during which it was being absorbed was characterised by relief of the symptoms. Making the logical deduction from this observation Murray in 1891 attempted to treat a myxœdematous patient with continued injections of a simple glycerol extract of sheep's thyroid and was immediately successful; shortly afterwards it was found that the thyroid could be given equally well by mouth and the replacement therapy of myxœdema thus became established on a firm basis.

The actual nature of the essential function of the thyroid was obscured for some time by the effects of removal of the parathyroid glands; these were not recognised at this date as independent entities and tetany resulting from their removal was often an accidental accompaniment of thyroidectomy, particularly in carnivorous animals. The success of the replacement therapy however at least provided the final proof that the thyroid exercised its function through the medium of an internal secretion.

Soon after replacement therapy had become established it was observed that administration of large amounts of thyroid resulted in great increase in nitrogenous excretion, whilst there was diminished nitrogenous excretion in myxœdema; it was further shown by Magnus Levy (1895, 1897) that the total gaseous exchange, which is an accurate index of the total metabolism, was increased in thyroid intoxication and diminished in myxœdema. It therefore became apparent that the principal function of the thyroid was to control the metabolic rate of the body as a whole, and this generalisation still covers all the diverse physiological effects of the thyroid which have since been described except those which affect its relationships with other organs of internal secretion.

Iodine Therapy in Simple Goitre

Endemic goitre was known from ancient times to be confined to certain regions—usually mountainous districts relatively far removed from the sea. As exploration was extended it was realised that the disease was world-wide in distribution, but the general impression of the sort of regions in which it was likely to occur remained unchanged. Although many bizarre theories were advanced from time to time regarding the ætiology of the disease, the prevailing view was that the cause lay in environmental factors and most probably in some abnormality of the water.

Apart from the surgical measures which have already been mentioned the principal method of treatment of goitre was by the administration of burnt sponge. The earliest reference to this treatment which I have been able to find occurs in the writings of Arnaldus Villanovanus (*c.* A.D. 1280); thereafter it recurs constantly in the works of the mediæval European physicians. Curiously enough no reference to the burnt sponge treatment appears in medical works in this country until quite recent times. The method was however practised in England in the form of the "Coventry treatment for bronchocœle," a secret remedy in the possession of a family of chemists at Coventry. After this remedy had long been a source of considerable profit to its proprietors, its nature was ultimately divulged to Dr. B. Wilmer, who published an account of it in 1779; its value was apparently accepted, since Wilmer's account appears almost verbatim in Black's "Medical Dictionary" (1800).

Now in 1812 iodine was discovered accidentally by the saltpetre manufacturer Courtois in the ash of burnt seaweed, and in the next year was identified as an element by Gay Lussac; a few years later it was isolated from the sponge (Fyfe, 1819). About this time there was working in Geneva, where endemic goitre was very severe, a physician by the name of Coindet. Having heard of the discovery of iodine and bearing in mind the traditional goitre remedy of sponge ash, Coindet, although in ignorance of the actual isolation of iodine from sponge, made the inspired guess that the newly discovered element might be the active principle of the traditional remedy.

The success which attended the first tests which Coindet (1820) made of his theory was dramatic; large goitres of long standing disappeared with incredible speed in response to administration of iodine, and the enthusiasm aroused by the success was such that people took to carrying little bottles of the magic element hung round their necks like charms. This excessive enthusiasm had a most unfortunate effect, for the incautious administration of too large amounts of iodine led in not a few cases to the production of a severe form of hyperthyroidism which was much more dangerous to the patient than the original goitre, and the iodine treatment thus fell into disrepute.

The early success however had left its mark and led logically to the development of the idea that endemic goitre might be due to environmental deficiency of the element, the administration of which had such a dramatic effect on the disease. About the middle of the last century an extensive investigation on these lines was undertaken in France by Chatin (1850–1860), who demonstrated quite clearly that a relationship did in fact exist between environmental deficiency of iodine (chiefly as indicated by the low iodine content of the water) and the occurrence of endemic goitre. Chatin's results were not accepted by the French Academy, and his work therefore failed to make much impression at the time; it has however been amply confirmed by subsequent investigations in different parts of the world, particularly by McClendon in America and by von Fellenberg in Switzerland, and in view of the technical difficulties under which he laboured it is deserving of the greatest credit.

Iodine in the Thyroid

The connexion which various lines of works had clearly shown to exist between iodine and the normal functioning of the thyroid led that most able worker Kocher to postulate the existence of iodine in the gland itself, and it was at his suggestion

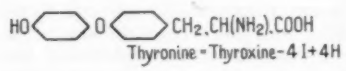
that a search for iodine in the thyroid was instituted. This search was crowned with success in 1895 when Baumann demonstrated the presence of iodine in the ash resulting from alkaline incineration of a hydrolysis product of thyroid gland. Moreover, not only was Baumann able to show that iodine was present, but he found also that the amount of it bore some sort of relationship to the physiological activity of the gland as tested in replacement therapy; there was therefore a strong indication that the iodine actually belonged to the active principle.

It was soon found by Baumann that the iodine of the thyroid was practically confined to the colloid and that it was present in some sort of organic combination. From the colloid there could be prepared a characteristic protein, thyroglobulin (Oswald, 1901), which contained most of the iodine, and by gentle acid hydrolysis of this protein or of the crude colloid a certain concentration both of iodine and of physiological activity could be effected, products being obtained which under the best conditions contained 10–15 per cent. of iodine. No thorough purification could be effected by acid hydrolysis however, nor was enzymic digestion of thyroglobulin any more successful; the first real progress came when the method of alkaline hydrolysis was systematically studied. In 1914 Kendall succeeded, by hydrolysis of thyroid glands with 5 per cent. sodium hydroxide followed by a long and complicated process of fractionation, in isolating a minute yield of a crystalline compound containing 65 per cent. of iodine which he named thyroxine and which exhibited, qualitatively at least, all the physiological properties of the thyroid (Kendall, 1919).

Chemistry of Thyroxine

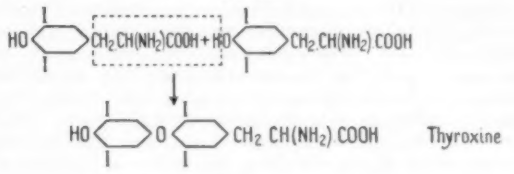
Progress with the chemistry of thyroxine was necessarily delayed until a more economical mode of isolation could be devised; this was eventually achieved in the form of a graduated hydrolysis with baryta (Harington, 1926[1]) by means of which there could be obtained from a good sample of dried thyroid somewhat over 0·1 per cent. of pure thyroxine. With the larger supplies of thyroxine which thus became available work on its constitution could be seriously undertaken. Removal of the iodine from thyroxine by a method which was known to involve no secondary alterations in the molecule gave a compound which was a phenolic amino-acid evidently related in some way to tyrosine. Systematic degradation of this product (thyronine) showed in fact that it was the *p*-hydroxyphenylether of tyrosine (Harington, 1926[2]). It is a matter of some interest that thyroxine is the first natural product in which the phenylether linkage has been found to occur (Fig. 1). Thyroxine was thus proved to be a tetra-iodo derivative of thyronine, but the positions occupied by the iodine atoms remained uncertain.

FIG. 1



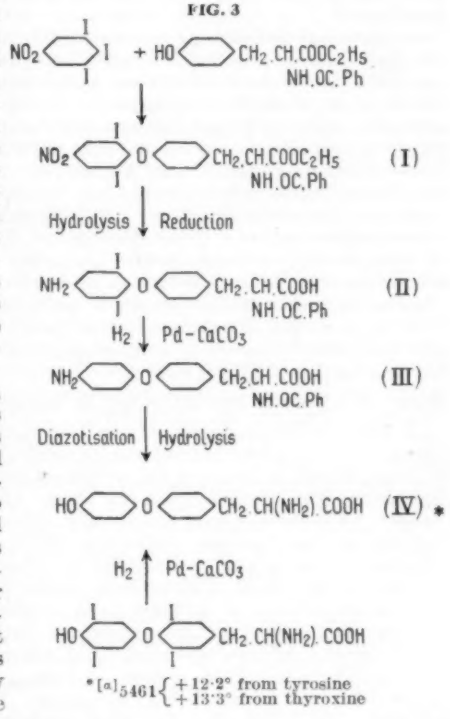
Now if we consider the possible ways in which thyroxine can arise in the body from known simpler precursors, we find that there is one course of reactions which is not only possible but highly probable. Until thyroxine was discovered only one other iodine-containing amino-acid was known; this was 3 : 5-diiodotyrosine, which had been isolated by Drechsel (1895) from a coral, and which is very readily produced from tyrosine in the laboratory by direct iodination of the latter in alkaline solution. (Incidentally it may be mentioned that 3 : 5-diiodotyrosine represents the form in which iodine occurs in the sponge.) We may assume therefore that interaction of iodine with tyrosine is likely to give rise to diiodotyrosine in the animal body. If such formation of diiodotyrosine is an intermediate step

FIG. 2



in the biological synthesis of thyroxine, the skeletal structure of the latter, as determined by the work on the constitution of thyronine, suggests that the final stage of the synthesis must consist of the coupling of two molecules of diiodotyrosine. There is only one way in which such a coupling is likely to occur—namely, by an oxidation involving the loss of the side-chain of one of the reacting molecules (Fig. 2). In this way we should obtain a compound in which the iodine atoms occupied the 3 : 5 : 3′ : 5′-positions of the molecule of thyronine.

FIG. 3



Certain features of its chemical behaviour also pointed to this constitution for thyroxine, but it was mainly upon the biochemical hypothesis that the attempt at the synthesis of thyroxine was based. The synthetic preparation of a compound of the suggested constitution did in fact yield a product which was chemically and physiologically indistinguishable from thyroxine isolated from the thyroid gland (Harington and Barger, 1927).

The successful outcome of this synthesis in itself provided confirmation of the biochemical theory upon which it was based. Further extensive support for this theory has since been provided by chemical and biochemical investigations. The biochemical facts in this connexion will be dealt with later;

at this point it is convenient to mention some recent work of a chemical character which has a direct bearing on the matter under discussion.

The case for the biological origin of thyroxine from tyrosine would obviously be greatly strengthened if the two naturally occurring compounds could be shown to be configuratively related. That they are in fact so related has been proved as follows (Canzanelli, Randall, and Harington, 1934). If *N*-benzoyl-*l*-tyrosine ethyl ester is condensed with 3 : 4 : 5-triiodonitrobenzene the compound (I) is obtained; on hydrolysis and reduction this is converted into the benzamido-acid (II) which in turn can be deiodinated to give (III) (Fig. 3). Diazotisation and hydrolysis of (III) then yield thyronine (IV). Since none of the reactions in the above synthesis involve the possibility of a Walden inversion the thyronine finally obtained must be related to the tyrosine employed as starting material. The thyronine obtained in this way from natural *l*-tyrosine had $[\alpha]_{5461} + 12{\cdot}2°$. A second preparation of thyronine was then made by catalytic deiodination of natural *l*-thyroxine, a process which again is known to involve no inversion; in this case the product had $[\alpha]_{5461} + 13{\cdot}3°$, and the configurative relationship between tyrosine and thyroxine was thus established.

At the stage which we have now reached therefore we may take it as established that the thyroid exercises its essential function as a regulator of metabolism through the medium of an internal secretion and that the characteristic physiological properties of this secretion are concentrated in the iodine-containing amino-acid thyroxine; moreover the latter compound originates in the body from tyrosine, the synthesis being effected through the intermediate stage of 3 : 5-diiodotyrosine. Discussion of the very important further question whether thyroxine constitutes the complete active secretion of the thyroid will be postponed until the second lecture, and the remainder of the present lecture will be devoted to consideration of the rôle of iodine in the ætiology of simple goitre.

Rôle of Iodine in the Ætiology of Simple Gotire

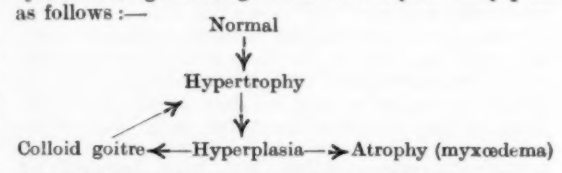
It was first shown by Halsted in 1896 that extirpation of a large proportion of the thyroid gland of a normal animal is followed by a characteristic overgrowth of the residual portion. This overgrowth consists of a change in character and an increase in amount of the glandular epithelium which lines the follicles of the gland. Normally the follicles are spheroidal and filled with colloid, whilst the lining epithelium consists of a single layer of flattened or cubical cells; during the process of hypertrophy which follows subtotal extirpation of the gland the cells of the epithelium become columnar in form whilst the colloid gradually disappears from the follicles; the latter thus lose their spheroidal form, being invaded by processes of the hyperplastic epithelial tissue, until ultimately the latter comes to constitute practically the whole of the gland. Having regard to the cause which elicits these changes they must be considered as being of a compensatory character—i.e., as representing an effort on the part of the small residue of gland to fulfil the function of the whole organ. Such an idea is evidently in accordance with the view that the colloid is the storage form of the thyroid secretion which is itself manufactured by the epithelial cells.

About ten years after Halsted's work appeared Marine began his extensive and fruitful observations on the spontaneously occurring enlargement of the thyroid which was common in man and the domestic animals in the region of endemic goitre where he was working (Cleveland, Ohio). Systematic examination was made of the thyroid glands of dogs (90 per cent. of which in this particular district showed more or less enlargement) and the work was subsequently extended to oxen, sheep, and pigs, and finally to man with similar results. It was found that among the glands thus examined all the stages of the characteristic glandular hyperplasia described by Halsted were represented; moreover it appeared that these changes could occur in two distinct series: (*a*) starting from a normal gland, and (*b*) starting from a colloid goitre (Marine and Lenhart, 1909 [1]).

Now chemical investigation of these pathological thyroids revealed a most important fact—namely, that in those glands which exhibited more or less epithelial hyperplasia an inverse relationship existed between the iodine concentration and the total weight of the gland. In other words the more advanced was the hyperplasia the less iodine (and therefore presumably active secretion) did the gland contain. All thyroids which were histologically completely normal contained 0·1 per cent. or more of iodine calculated on the dry weight of the gland; with the appearance of early glandular hyperplasia the iodine concentration fell sharply below this critical level and as the pathological process progressed the iodine concentration ultimately became vanishingly small.

Marine's observations were next extended to the study of experimentally produced thyroid enlargement. He found that the same series of changes which had been produced by Halsted and which he himself was also able to elicit by partial extirpation of the gland, not only arose spontaneously in regions of endemic goitre, but could be brought about in the normal animal by restriction of the intake of iodine. On the other hand, administration of liberal amounts of iodine prevented the hyperplasia of the residuum of thyroid tissue after subtotal thyroidectomy and was also able to bring about involution of a hyperplastic thyroid (Marine and Lenhart, 1909 [2]). Such involution was accompanied by return to normal function on the part of the gland, but not to normal structure; whilst the epithelial tissue diminished in amount and resumed its normal structure, the follicles were distended with an excessive amount of colloid and the result was in fact a colloid goitre. Reimposition of restriction of iodine intake caused such a colloid gland to undergo a series of changes precisely similar to those which have been described for the normal gland, and there thus emerges an experimental basis for the two series "normal" and "colloid" into which Marine divided his pathological material; the "normal" series representing the primary response of a normal gland to restriction of iodine, and the "colloid" series the response to the same stimulus of a gland which has already passed through the stages of hypertrophy-hyperplasia-involution one or more times.

Following Marine therefore we may recognise a cycle of changes through which the thyroid may pass as follows:—



noting that persistent restriction of iodine may break the cycle by preventing involution of the hyperplasia

and causing fibrosis atrophy to supervene with production of myxœdema.

Consideration of the results of Marine's experimental work together with the facts which are now at our disposal regarding the nature of the active principle of the thyroid and regarding the relationship of environmental deficiency of iodine to the occurrence of endemic goitre seems to me to lead to a perfectly reasonable biochemical explanation of the ætiology of simple goitre. It is clear that restriction of the supply of iodine to the thyroid whether due to environmental deficiency of the element or to artificially imposed conditions produces the same effect on the gland as does subtotal extirpation; in the case of iodine starvation also therefore we must regard the reaction of the gland as compensatory in character.

In order that the metabolic processes of the body may be maintained at their normal level it is necessary that the thyroid should provide a certain minimum amount of its active secretion, for the manufacture of which a corresponding minimum amount of iodine must be supplied from exogenous sources. When a large proportion of the gland is removed, as in Halsted's experiments, we have seen that the residual portion responds to the increased demand upon it firstly by using up the colloid which represents its store of ready-made secretion, and secondly by hypertrophy of the glandular epithelium in the effort to increase the efficiency of its synthesising mechanism. It is not surprising that a precisely similar series of events should result from an additional strain imposed upon the gland by restriction of the supply of the essential precursor for manufacture of its secretion.

The conception that simple goitre represents a work-hypertrophy of the thyroid in response to restriction of the exogenous supply of iodine is adequate to account for almost all that is known of the occurrence of the disease in its endemic form. None of the many other theories which have been proposed from time to time to account for the malady have received any substantial support from observation or experiment, whilst, with the possible exception of certain areas in New Zealand, there is no region where goitre is severely endemic in which it has not also been possible to demonstrate an environmental deficiency of iodine.

It is evident that environmental deficiency of iodine alone cannot be made to account for all goitre. Goitre occurs sporadically in regions where there is abundance of iodine, and moreover goitre in man tends to exhibit certain peculiarities which are absent from the thyroid enlargements commonly observed in animals. Interference with the access of iodine to the thyroid may however occur in other ways than as the result of environmental deficiency of iodine, besides which it must not be forgotten that an additional demand for thyroid activity imposed at a time when the intake of iodine is just sufficient for normal requirements will cause a relative deficiency of iodine which is likely to elicit a hypertrophic response on the part of the thyroid.

An example of the first possibility is probably afforded by the goitrigenic effect of diets rich in fats. This phenomenon has long been recognised in a somewhat indefinite way and was demonstrated experimentally by Mellanby and Mellanby (1921) with puppies. The effect is produced particularly strongly by unsaturated fats, and it seems reasonable to suppose that these may interfere with the absorption of the iodine which is taken in with the food and thus prevent the thyroid from obtaining its necessary minimum of iodine, although there may be no environmental deficiency of the latter.

The second possibility—namely, the production of a relative deficiency of iodine owing to imposition of additional demands on the thyroid—is illustrated by the fluctuations in the size of the thyroid which occur in normal women at different stages of the sexual cycle and by the fact that in regions of endemic goitre the disease is particularly liable to manifest itself at times when there is heavy physiological demand upon the thyroid—e.g., at puberty or during pregnancy. In Marine's work also the effects of artificial restriction of iodine intake were much more severe when the restriction was imposed on a pregnant animal—i.e., when there were both relative and absolute deficiencies of iodine.

It seems to me therefore that it is safe to make the generalisation that the immediate cause of all simple goitre is failure of access of a sufficiency of iodine to the thyroid; in the case of endemic goitre this failure is to be ascribed directly to environmental deficiency of iodine; in the case of sporadic goitre either directly to interference with the absorption of iodine or indirectly to the production of a relative iodine deficiency by the imposition of a demand upon the thyroid which, with its available supplies of iodine, it is unable to satisfy. In any case it is certain that no goitrigenic influence is at present known which cannot be antagonised by the administration of extra iodine. An interesting case of a natural antagonism of this sort is afforded by the Eskimos. The Eskimo diet contains a preponderance of fat and in view of the experimental production of goitre in animals by such diets the prevalence of goitre among the Eskimos might be anticipated. In point of fact the disease is unknown among this race, the explanation being that their diet includes a large amount of cod-liver oil, which is rich in iodine.

What has been said concerning the ætiology of simple goitre can be applied also to the ætiology of cretinism which must be regarded as the extreme manifestation of the results of iodine deficiency. In its endemic form cretinism is associated only with the most severely endemic goitre, and it is doubtful whether true cretinism occurs outside these special environmental conditions. A congenital disease strictly analogous with human cretinism has not been produced experimentally in animals; the nearest approach to it has been observed in the puppies born of bitches which have been subjected to subtotal thyroidectomy and/or restriction of iodine during pregnancy; in these cases the thyroids of the newborn puppies show a high degree of hyperplasia. In human cretinism of the extreme type on the other hand the thyroid at birth has already passed beyond the stage of hyperplasia to that of fibrosis atrophy, so that the disease may fairly be described as prenatal myxœdema. The fact that the thyroid of a cretin has already undergone irreversible pathological change during intra-uterine development is sufficient to explain the relative incurability of cretinism by replacement therapy as compared with the curability of myxœdema in adult life which involves no more than a retrogression of fully developed physiological functions.

The peculiarities which distinguish goitre in man from the corresponding disease in animals are the greater tendencies in man for the disease to terminate in atrophy of the thyroid with resulting myxœdema or cretinism and for the enlargement of the thyroid to occur in nodular masses (so-called adenomata) instead of in the regular manner observed in animals. For the first of these peculiarities there is, so far as

I am aware, no explanation available; it may be noted however that true myxœdema and cretinism seem to be peculiarly human diseases, since even total extirpation of the thyroid fails to reduce the lower animals to a condition entirely similar to that of a human being suffering from advanced myxœdema, nor, as we have seen, can experimental cretinism be readily produced. The tendency towards nodular enlargement of the human thyroid may perhaps be explained by the fact that owing to greater variations in the intake of iodine and to greater fluctuations in the physiological demand upon the gland, the human thyroid may be subjected to more frequent repetitions of the hypertrophy-hyperplasia-involution cycle; it has been shown by Womack and Cole (1931) that repeated induction of such series of changes by injection of irritant substances into the thyroids of animals may give rise in these also to nodular hypertrophy analogous with that found in the human subject.

However this may be, the final proof of the hypothesis of the association of iodine deficiency with endemic goitre is to be found in the success which in recent years has attended prophylactic iodine therapy. The original iodine therapy practised by Coindet and his followers failed because the dosage employed was excessive and because the curative treatment only was tried. Since it has been realised that iodine is of most effective use as a prophylactic and since biochemical work has given an indication of the amount of iodine which is actually required the position has entirely changed. Since the first successful large-scale experiment of Marine and Kimball (1917, 1920, 1921) some fifteen years ago the practice of iodine prophylaxis in regions where there is environmental deficiency of iodine, particularly in Switzerland and in the United States, has become continuously more firmly established, and there seems reason to hope that with the judicious pursuit of such measures endemic goitre and cretinism will ultimately cease to constitute serious problems.

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NORTH STAFFORDSHIRE ROYAL INFIRMARY.—The new ophthalmic wards at this hospital, given by the president, Mr. Edmund Corn, have been opened by Sir William Lister, consulting surgeon to the Royal London Ophthalmic Hospital.

STAPHYLOCOCCAL PNEUMONIA AMONG INFANTS IN A MATERNITY HOSPITAL

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AN outbreak of staphylococcal infections occurred in July, 1933, in a Glasgow maternity hospital of 25 beds. The outbreak was of a decidedly unusual character and presented several features which are not without importance from the standpoint of preventive medicine. It is with pleasure that I thank Dr. W. R. Wiseman, city bacteriologist, Dr. F. E. Reynolds, pathologist, Stobhill Hospital, Dr. R. Cruickshank, bacteriologist, Glasgow Royal Infirmary, and Dr. M. A. Urquhart, bacteriologist, Stobhill Hospital, for kind permission to make full use of the valuable reports which each of them furnished and for advice they have given in the preparation of this paper.

Description of the Outbreak

FOUR FATAL PNEUMONIA CASES

In July, 1933, four infants, who had all been born in the hospital, died after an illness of short duration, the cause of death being ascribed in each instance to pneumonia. The following statement shows the date of birth, date of sickening, &c.

Case.	Sex.	Date of birth.	Date of dismissal from hospital	Date of sickening.	Date of death.
		July	July	July	July
1	F.	1st	13th	13–14th	15th
2	M.	1st	14th	14–15th	17th
3	M.	4th	—	16th	18th
4	F.	5th	18th	18th	19th

In all four cases the birth was normal, and the infants were healthy during the first 12 days of life.

Cases 1, 2, and 4 were reported to have become ill within 24 hours of leaving hospital, although no abnormality was observed at the time of dismissal, and, in the remaining case, death took place in the institution. At autopsy of two of the cases (Nos. 3 and 4), performed by Dr. F. E. Reynolds, pulmonary consolidation confined to one lobe was found, together with signs of a general toxæmia, and, therefore, it was at first suspected that a pneumococcal infection of unusual virulence and infectivity was the ætiological factor. Accordingly, on the following days (July 21st and 22nd, 1933), material obtained from the posterior pharynx of 18 members of the nursing staff and three of the mothers, whose infants had died, was examined by Dr. R. Cruickshank. From eight of the nurses and from two of the mothers, Group IV. pneumococci were isolated, but in no instance was a pneumococcus of Types I., II., or III. recovered. Furthermore, pneumococcus was not found in cultures from nasal and from throat swabs of infants in the hospital; nor, as will appear later, was this organism cultivated from material obtained at autopsy of the two cases examined. Thus, at an early point in the investigation, evidence was available which excluded a pneumococcal infection as the cause of the deaths. A streptococcal infection, on the other hand, did not, on epidemiological grounds, appear likely to be the responsible agent, because among the mothers in the hospital there had been no recent cases of puerperal sepsis or other manifestations of streptococcal invasion. Members of the

nursing staff also, who were carefully examined, appeared to be free from any septic foci.

The identity of the responsible infection became apparent when the bacteriological and histological findings in the two cases autopsied were correlated with the cultures obtained by swabbing the infants in the hospital.

The following are the reports on the two cases autopsied, together with brief clinical histories. The bacteriological results were confirmed by Dr. Cruickshank, who also performed mouse inoculation tests.

CASE 3.—This infant when two days old was thought to have a slight cold, as there was some nasal discharge and occasional cough. On July 16th, when 12 days old, he became seriously ill with frequent respiration, and on the following day he was found to be fevered; signs of pulmonary consolidation were detected and some blood-stained discharge from the mouth was noted. Death took place on the 18th.

Post-mortem examination revealed the presence of a copious exudate over the whole of the pleural surface of the left lung and adjacent parietes. There was consolidation of the lower lobe of the same lung but, so far as touch was concerned, no consolidation of the upper lobe. There were no pathological changes in the right lung. A number of large petechial hæmorrhages under the visceral pericardium, especially in the neighbourhood of the posterior auriculo-ventricular groove, were observed. There was general congestion of the organs.

On *histological examination* of sections of the left lower lobe, numerous irregular and closely approximated abscesses were seen. The pulmonary tissue intervening between these was intensely congested and the alveoli were filled with an exudate, which, in places, was largely fibrinous and, in other parts, hæmorrhagic. In the intervening tissue also were numerous colonies of staphylococci. The lining of the smaller bronchi had been almost completely desquamated and the lumen contained pus and blood. At one place an abscess was seen surrounding the bronchial wall, portions of which had become necrotic, permitting the eruption of pus into the lumen. In the left upper lobe microscopical preparations showed the fibrino-purulent layer on the surface of the organ to contain a considerable amount of blood. In the pulmonary substance catarrhal changes in the bronchi were marked and there was a small amount of fibrino-cellular exudate in the alveoli. The interstitial cells had proliferated and small areas of collapse were present. In both lobes blood-vessels were greatly congested.

The *bacteriological results* were as follows:—

Organ examined.	Direct culture.	Mouse inoculation test.
Lung ..	*Staphylococcus aureus.*	Mouse survived.
Spleen ..	do.	Mouse died. *S. aureus* recovered.
Liver ..	No growth.	Test not performed.
Heart ..	do.	Mouse survived.

Commentary.—"At the time of the autopsy the case was considered one of acute lobar pneumonia affecting the lower lobe, with consequent pleurisy of the whole of the left pleural cavity. The result of the bacteriological examination, however, showed that it was not an ordinary case of pneumonia, as the pulmonary infection was due to staphylococcus and not to pneumococcus. The result of the histological examination was in agreement, the left lower lobe containing numerous abscesses, microscopical in size. The tissue intervening between these abscesses was shown to be completely consolidated, and this explains why the macroscopical appearances simulated those of acute lobar pneumonia due to pneumococcus. The case further resembled an ordinary acute lobar pneumonia in that the infection was confined to one, namely, the left lower, lobe. No precise reason could be offered to explain why the upper lobe of this lung or the right lung had not been infected."

CASE 4.—This infant made satisfactory progress after birth, and when taken from hospital at 10 A.M. on July 18th she appeared to be quite well. At 3 P.M. the same day, however, respiratory embarrassment was noticed; three hours later a little blood was coughed up, followed, it was reported, by vomiting of blood. Two practitioners who were called in diagnosed pneumonia. At 10 P.M. the same evening blood appeared from the nose, and during the night difficulty in breathing increased until death took place at 4 A.M. on July 19th. The duration of illness, from 3 P.M. on July 18th to 4 A.M. on the following day, was thus only about 13 hours.

At *autopsy* the right pleural cavity was found to contain a large amount of blood, and in the pericardial sac there was a small quantity of blood-stained fluid. The right lower lobe was completely consolidated, the lobe being reddish-purple in colour, but on macroscopical examination no consolidation of the other lobes was found. The heart-muscle was dark in colour and one or two small petechial hæmorrhages were seen under the visceral pericardium. Marked congestion of all the organs, especially the liver, was present. The stomach contained blood.

On *histological examination*, sections of the right lower lobe showed large portions to be consolidated owing to the alveoli being completely filled with blood. In the hæmorrhages numerous colonies of staphylococci were present, and, here and there, abscess formation was commencing. In the right upper lobe the lining of the bronchi had been desquamated to a great extent and the lumen contained the desquamated cells with a few red blood corpuscles. The histological picture of this lobe was exactly similar to that of the left upper lobe in Case 3 in that proliferation of interstitial cells had occurred with small areas of collapse: in parts a certain amount of hæmorrhage had occurred into the alveoli and small colonies of staphylococci were encountered.

The *bacteriological results* were as follows:—

Organs examined.	Direct culture	Mouse inoculation test.
Lung ..	Coliform bacilli.	Mouse died. *S. aureus* recovered.
Spleen ..	No growth.	Test not performed.
Liver ..	*S. aureus.*	Mouse died. *S. aureus* recovered.
Heart ..	No growth.	Mouse survived.

Commentary.—"The case was one of intense hæmorrhagic inflammation of the lower lobe of the right lung due to *S. aureus*, with the usual signs of general toxæmia. The blood in the stomach was due, probably, to swallowing hæmorrhagic exudate which had occurred into the right lung and had been coughed up."

The above results showed that in each case death had been due to *S. aureus* infection. A striking feature of both cases was that on naked-eye examination the pulmonary consolidation was confined to a single lobe.

With regard to Cases 1 and 2, in which no opportunity for a post-mortem examination was presented, it may be stated that in the former hæmorrhages were reported just before the end, and in the latter there were convulsions on the day of death. As these infants became ill at the same time as the cases investigated by autopsy, and, as the clinical history was similar, it is a reasonable presumption, amounting almost to a certainty, that they also succumbed to a staphylococcal infection of the lungs.

RESULTS OF NASAL AND THROAT SWABS OF INFANTS IN THE HOSPITAL AND COMPARISON WITH CONTROL GROUP OF INFANTS

The bacteriological and histological findings just described form an interesting comparison with the results of nasal and throat swabs of the infants in the hospital. The bacteriological work involved in the examination of these swabs and of swabs taken from a control group of infants in another hospital was done by Dr. Wiseman, who took a

special interest in the outbreak. On July 20th, 6 infants, who were then in isolation on account of slight nasal discharge or occasional cough, were swabbed. Cultures from the nasal swabs yielded profuse growths of *S. aureus* in all cases, an unexpected and very arresting feature of the preparations. In 4, pure cultures were obtained, and in 2, streptococci were also present. With reference to the throat swabs, *S. aureus* was cultured in three cases, in each of which it was accompanied by streptococci: streptococci alone were found in two, and in the sixth case *Staphylococcus albus* and streptococci. Pneumococcus was not found in any specimen.

On July 26th, 15 infants, who were not in isolation and whose ages on that day ranged from three to ten days, with an average of 6·3 days, were examined. *S. aureus* was recovered from either nose or throat in all but 3. Nasal swabs gave profuse and vigorous growths of *S. aureus* in 12 cases, of which 10 were pure cultures, and in the remaining 2 cases streptococci were also found. Throat swabs yielded cultures of *S. aureus* in 9 cases: in only one instance, however, was a pure growth obtained, while in 7 streptococci were also present and in one case *Staphylococcus albus*. The organism, as cultivated from the nose in this group of 15 children, was much more vigorous in proliferation than that from the throat. These findings, especially the results of the nasal swabs, were considered by Dr. Wiseman to be most unusual and to indicate a widespread *S. aureus* carrier condition among the infants.

As a control, swabs were taken from a group of 16 healthy infants in another hospital on August 2nd, on which day the ages of this group ranged from 3 to 18 days, with an average of 7·7 days. Six of the nasal swabs yielded *S. aureus* and in two of these cases the same coccus was also isolated from the throat. In two cases *S. aureus* was cultured from the throat only. In each instance it was observed that the growths were scanty and that *S. albus* was also present. Cultures from eight of the infants were negative for *S. aureus*. The control group of children and the infants in the infected hospital were accordingly found as groups to exhibit marked differences in the bacteriological picture as far as concerned the numbers of *S. aureus* present. As it was evident that practically all the infants in the institution were harbouring *S. aureus*, it was recommended that further admissions should cease, and on the advice of a rhinologist a nasal ointment (2 per cent. argyrol) was employed in an effort to control the carrier condition. Fortunately no further cases occurred. By August 7th the last patient had left the hospital and on opening five days later, after disinfection had been carried out, there was no recurrence of the infection.

COURSE OF EVENTS IN THE HOSPITAL PRECEDING THE PNEUMONIA CASES

The exact source of infection in this outbreak was not discovered, but the course of events was ascertained to have been as follows:—

(1) On June 22nd, 1933, an infant in the hospital, then seven days old, was noticed to have developed sepsis of the subcutaneous tissues of the shoulder, which, in spite of surgical treatment, rapidly extended and was followed by widespread sloughing and undermining of the skin. The infant died in the hospital on June 30th. No examination of the pus was made until a few hours before death, when a swab was taken from a deeply seated pocket of pus. *Bacillus coli* and a late lactose-fermenting organism were isolated but these were probably secondary invaders.

(2) On July 2nd one of the mothers in the hospital and on July 6th two of the mothers began to suffer from mastitis. Incision of the abscess was done in all three cases between the 5th and 11th, and in no instance was the pus examined. A feature of these cases, of which the significance could not be tested, was that immediately prior to the development of mastitis they were all attended by the same nurse, who, unfortunately, had left the institution before inquiries were made.

(3) Between July 1st and 16th, and especially during the first five days of the month, an unusual prevalence of minor septic skin lesions was recorded. On an average three to four children required attention for septic spots, although on one day as many as nine infants were noted as having been treated.

(4) On July 12th an infant, who was then six days old, developed a breast abscess which required incision two days later. The infant was isolated in the hospital from the beginning of the disease. No bacteriological examination of the pus was made.

(5) Between July 13th and 29th 11 infants were isolated in the hospital for periods varying from three to six days on account of mild catarrh of the upper respiratory tract.

It was between July 13th and 18th that four infants sickened and died after an illness of less than 48 hours' duration from what was clinically regarded as pneumonia. In two of the cases death was proved at autopsy to have been due to *Staphylococcus aureus* pneumonia.

It may also be noted that among the 55 mothers who were dismissed from the hospital between July 1st and August 7th, and who resided in Glasgow, 6 cases of suppurative mastitis were subsequently found on a follow-up inquiry. If the 3 cases of breast abscess which occurred in the institution between July 2nd and 6th are included, this means that there were in all 9 instances of mammary infection among the adult patients. Of the 6 cases in which mastitis appeared subsequent to dismissal there were 2 which are worthy of note. The mother of infant No. 4, who died of staphylococcal pneumonia on July 19th, was dismissed from hospital on July 18th, and ten days later she contracted a mammary gland infection which required incision. The other case was the mother of the infant who, as noted above, was found on July 12th to be suffering from a breast abscess. This mother left hospital before her child and returned twice daily to nurse her baby until his dismissal on July 26th. On the 28th a breast abscess developed in the mother which had to be incised about a week later.

It is necessary to mention what is regarded as an important factor in the spread of infection once this had gained entrance. The infants normally slept at night in cots in the ward beside their mothers. If, however, a child should be noisy he would be removed to a large room, which was the infants' bathroom but was also known as the night nursery. This room, incidentally, was deficient in light and ventilation, and after the epidemic the defects were remedied by structural alterations. In the early part of July, 1933, an unusual number of children had to be taken to the nursery on account of being restless at night, and on one occasion as many as 18 infants slept there. The nursery contained two barrows for holding infants; one, 7 ft. long with eight compartments, and the other, 4 ft. long with five compartments. When the barrows were fully occupied there was thus a distance between heads of infants of 10½ in. in the former and 9½ in. in the latter. It is obvious that once an infection had obtained a footing, sleeping arrangements provided by barrows of this nature would readily facilitate the spread of disease. Such barrows should probably not be used at all, and if in institutions they are found indispensable, then they should be reserved

for purposes of transport and other functions of a temporary nature.

Discussion

In the absence of bacteriological examination of pus from the case of phlegmonous abscess, from the cases of mastitis, and from the cases with septic spots, there is no indisputable evidence that the series of events narrated is not simply a collection of chance happenings. The first case with the phlegmonous subcutaneous sepsis may have been due to a staphylococcal or to a streptococcal infection; there is agreement, however, that in superficial septic skin lesions and, more particularly, in mastitis the staphylococcus is the organism most frequently recovered. Since two of the fatal cases were proved to have succumbed to a staphylococcal pneumonia, and the other two similar cases not autopsied were almost certainly due to the same infection, and since examination of the infants, some of whom were suffering from symptoms of upper respiratory tract catarrh, showed that they were practically all harbouring *S. aureus* in the nasal and faucial passages to a very unusual degree, it is justifiable to conclude that, with the possible exception of the first case, the various events are all closely related ætiologically. In other words, all the cases are considered to be different clinical manifestations of the same infection and to form one epidemiological event.

In outbreaks of a streptococcal origin varying clinical representations are not uncommonly encountered—e.g., tonsillitis, scarlet fever, otitis media, puerperal sepsis, erysipelas, and pneumonia—but in an outbreak of staphylococcal causation a similar phenomenon is unusual. In ordinary circumstances *S. aureus* is thought not to possess the same degree of infectivity as that of the streptococcus. Attention is drawn to the fact that no serious case of illness occurred among the mothers and that the terminal phase of the outbreak consisted of four cases of fatal pneumonia. The latter fact supports the statement of Menten and others (1932) that "*Staphylococcus aureus* seems to have the propensity for inducing disease in infants that is not so evident in older persons." It is also remarkable that among the infants who suffered from minor septic skin lesions, no case of pemphigus neonatorum occurred. Swendson and Lee (1931) state that numerous observers have confirmed the fact that the responsible organism in this infection is a specific strain of *S. aureus*.

With regard to staphylococcal pneumonia, the disease is not uncommon and is generally secondary either to a septic focus elsewhere in the body or to an acute infection such as influenza, measles, or whooping-cough.

Chickering and Park (1919) in an investigation of 312 deaths from influenzal pneumonia found 135 to be associated with *S. aureus* in the lung. These cases were considered to possess characteristic clinical manifestations.

Menten and others in a bacteriological study at necropsy of 131 cases of pneumonia in children, both primary and terminal, isolated the staphylococcus alone in 11 instances and mixed with other bacteria in 65 cases.

Reimann (1933), after quoting a number of investigations, states that the incidence of staphylococcus lung infection has not changed materially since Netter's report of 1892, in which he found the staphylococcus in pure culture in 7·7 per cent. of his cases. Reimann describes 6 cases of what is regarded as primary staphylococcal pneumonia; in all his cases there were preceding conditions—viz., influenza-like infection (2 cases), asthmatic bronchitis, sore-throat, chronic nephritis, and malnutrition.

I have found no record of any outbreak of staphylococcal infection, including cases of pneumonia in infants.

It will appear from the facts recorded here that serious risks may be involved in any institution where infants are tended if lesions due to *S. aureus* are not regarded as of potentially serious import.

Summary

Four infants born in July, 1933, in a maternity hospital died of pneumonia within four days of each other. Three of the children became ill within 24 hours of leaving the institution, although no abnormality was observed at the time of dismissal, and the other one died in the hospital. The duration of illness in each case was about two days. At autopsy, which was held in two cases, the cause of death was shown to be staphylococcal pneumonia, and a feature of the pathological findings was that in both instances consolidation was on macroscopical examination confined to a single lobe, thus simulating acute lobar pneumonia. From swabs taken from infants in the hospital, six of whom were suffering from catarrhal symptoms, profuse growths of *Staphylococcus aureus* were recovered from the nasal and faucial passages in practically all cases. Examination of a control group of infants in another institution demonstrated the unusual incidence of the staphylococcus infection among the children in the infected hospital. It was ascertained that within the previous fortnight an infant had died of a phlegmonous abscess, three mothers and an infant had suffered from suppurative mastitis, and that among the infants there had been an unusual prevalence of minor septic skin lesions followed by a number of cases of mild upper respiratory catarrh. Further, 6 cases of mastitis after dismissal were discovered among 55 mothers who left the hospital between July 1st and August 7th. With the possible exception of the phlegmonous abscess, all the foregoing cases, including the 4 fatal pneumonia cases, are considered to have been different manifestations of staphylococcal infection and to form one epidemiological group. The spread of the disease was possibly facilitated by the nature of the temporary sleeping arrangements provided for the infants.

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RECENT OBSERVATIONS ON PSITTACOSIS

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During last year psittacosis, or parrot disease, has again attracted wide attention and the memory of the pandemic of 1929–30 has been revived. K. F. Meyer and B. Eddie have reported the widespread infection of Californian aviaries and breeding farms, and many human cases have occurred in Holland and especially in Germany. According to the figures of J. Fortner and R. Pfaffenberg, the number of human cases in Germany was nearly 150 during the first six months of 1934, that is almost three-quarters of the total number in 1930. The recent disease has generally appeared in the form of family endemics, and the

investigations have revealed, with rare exceptions, the remarkable fact that the source of the infections was not a sick parrot, but an apparently healthy budgerigar. In Germany, as in most European countries, the commercial importation of parrots and parakeets has been prohibited since 1930. This has prevented the importation of the disease from overseas, but the widespread dissemination of the psittacosis virus in 1930 evidently infected the domestic stocks, and the home-bred parakeet has become the conveyor of the disease to human beings. The budgerigar is less susceptible to psittacosis than are most species of parrots, and frequently becomes an apparently healthy carrier of the virus. This fact was proved beyond doubt for the first time in 1931, at the Robert Koch Institut in Berlin, where I was in charge of the psittacosis investigations in Prussia. The case was reported by the president of the Reichsgesundheitsamt, at the Office Internationale d'Hygiène Publique, Paris, in October, 1931, and April, 1932. The history of the case was as follows:—

In April, 1931, a family in Cologne, consisting of husband, wife, and stepson, fell ill with typical psittacosis which ended fatally in one case. Four apparently healthy budgerigars were found by the inspecting veterinary officer in the home of the patients. The birds were killed and sent to Berlin. To save experimental animals I pooled the suspensions of the organs (heart, spleen, liver, and lungs) of all the birds and diagnosed the presence of the virus by transmission to some canaries, all of which died of psittacosis.

The recent increase of psittacosis in certain places suggests that latent infection may also exist among budgerigars in this country. Obviously such an infection would remain unnoticed, even unsuspected, so long as no human cases attracted attention. Even the development of the disease and occasional deaths from psittacosis among the birds might escape observation. The epidemic of 1930 was widespread in England and it would be astonishing if no nidus existed.

The existence of such a nidus has been proved conclusively by certain work carried out at the National Institute for Medical Research during 1934. Through the kindness of the Ministry of Health I received on May 22nd last a budgerigar which had died four days previously. The bird was home-bred at an aviary in the South of England. The heavy contamination of the internal organs with a spore-bearing bacillus necessitated the filtration of the material. Mice were inoculated intraperitoneally with the filtered suspension of spleen and liver and died on the fifteenth and eighteenth days of typical psittacosis. A few weeks later two further birds, a rosella parakeet and a budgerigar from the same source, succumbed to psittacosis. In these two latter cases the diagnosis was made, not only by transmission to mice, but also by the direct microscopical demonstration of the virus in the typically affected organs of the birds. At the same time I was able to find psittacosis in three budgerigars which died in a large private aviary, in two of them immediately, by the miscroscopical demonstration of the virus. In this latter instance the infection was not due to an existing nidus but to a fresh importation. The history of that importation reveals a new fact.

On April 27th last a consignment of about 500 red cockatoos (galahs) and budgerigars arrived at Plymouth direct from Adelaide in Australia. The birds were intended for Belfast, but were collected provisionally by a dealer in London. It is believed that there had been a number of casualties among the birds during the voyage. Very shortly after their arrival here 8 galahs and 6 budgerigars died from psittacosis. The virus was demonstrated by transmission to mice, and in 5 of the birds—for the first time in naturally diseased parrots—directly by microscopical examination. The remainder of the Australian consignment had already been shipped to Belfast, where the infection continued, as the examination of 5 further dead galahs proved, so that the whole consignment, fortunately quarantined after warning by the English authorities, had to be destroyed. A second cargo of 52 budgerigars and 90 cockatoos from Australia, already at sea when the infection of the first was diagnosed, arrived a month later. Afterwards it became known that 43 of the birds had died during the voyage. Some of the birds immediately after arrival had been distributed to well-known aviculturists in this country. One of the fanciers, who had been warned after receipt of the birds, was the owner of the private aviary mentioned above, where the infection continued for some time.*

The fact that psittacosis, which previously was believed to occur naturally only in South America, is endemic also among Australian parrots and parakeets was unknown hitherto. A little later Meyer and Eddie reported the demonstration of the virus in budgerigars trapped in the vicinity of Adelaide. On their arrival in California the birds appeared perfectly healthy. They were strictly isolated, yet one month after their arrival cases of psittacosis occurred among them.

Quite recently, after the official communication of my results to the Australian authorities, infection has been proved in that country by F. M. Burnet (Med. Jour. of Australia, 1934, ii., 743.) Healthy parrots and parakeets, purchased at random from different dealers in Adelaide and Melbourne, were examined. Of 24 birds in Adelaide 33 per cent. were detected as carriers of the virus in the enlarged spleen. In Melbourne 9 or 10 out of 12 grass parakeets were probably carriers.

The freshly isolated strains, together with an old strain which I owe to the kindness of Prof. S. P. Bedson, presented the desired opportunity for me to continue at the National Institute for Medical Research my studies of the psittacosis virus, which were started in the beginning of 1930 at the Robert Koch Institut in Berlin. Some of the results of these previous and recent investigations may be mentioned here.

PSITTACOSIS IN THE MOUSE

The research on the disease in many laboratories during the pandemic of 1930 has afforded two facts of paramount importance for the diagnosis of psittacosis: the discovery of the virus and the recognition of the white mouse as a suitable experimental animal. The latter fact, established first by C. Krumwiede and co-workers in 1930, and studied thoroughly by T. M. Rivers and G. P. Berry, has made the laboratory work with psittacosis much less dangerous than when parrots, canaries, or rice birds were used (F. Neufeld and Levinthal). Nevertheless, the utmost caution must be observed, and this has been emphasised by some recent laboratory infections in Germany, one of which ended fatally. The experimental disease in the mouse is very characteristic. According to the amount of the virus injected intraperitoneally, the animals succumb after from two to thirty days. The symptoms of the illness, which may last for a period of one to several days before death occurs, consist of ruffled fur, eyes closed, often with some discharge, apathy, sometimes, but not often, diarrhœa.

* On April 20th, 1935, a consignment of parrots was imported from Australia by special permit for avicultural purposes. Most of them died on the voyage. Examination of a number of birds which died after arrival here revealed again the presence of the psittacosis virus.

The conditions found on post-mortem examination show three main types:—

(1) *Death 2–5 days after infection.*—The peritoneum contains a little sticky and stringy fluid, the liver is yellowish-pale and mottled, the spleen is of normal size and bright red, sometimes full of yellowish spots. The pericardial fluid is somewhat increased. Microscopically the liver and the spleen show small hæmorrhages and necrotic areas. The virus is abundantly present in the cells of the peritoneal fluid, of the omentum between stomach and spleen, and especially in the spleen, but is found in smaller amounts in the liver and the pericardium, but not in the pericardial fluid. The focus of infection is the reticulo-endothelial system, the cells of which are packed with the germs and show karyopyknosis and vacuolisation and fatty degeneration of the cytoplasm.

(2) *Death 5–15 days after infection.*—The abdominal cavity is filled with thick fibrinous masses, the intestines stick together, liver and spleen are coated with thick fibrinous membranes, which can be easily stripped off and cover a perihepatitis and perisplenitis. The fluid in the pleural and pericardial cavities is increased and clouded by fibrin and endothelial cells. The virus is present abundantly in the peritoneal exudate, especially in the perihepatitic and perisplenitic membranes, and in the cells of the pericardial fluid and in the pericardium itself. It is scarcer in the spleen.

(3) *Death 15–30 days after infection.*—The abdomen is distended, sometimes enormously, by a cloudy ascitic fluid, the pleural and pericardial cavities are filled with a serous-fibrinous exudate. Liver and spleen may be enlarged and friable. Serositis dominates the syndrome. The virus is extremely scarce in the ascitic exudate and in the spleen. The most suitable material for its demonstration is the pericardium.

In all three types the blood of the mouse contains very little virus, which is only to be seen occasionally in an endothelial cell. This is in striking contrast to its abundance in the blood of naturally or experimentally infected birds, where many desquamated endothelial cells are packed with it, or large clusters and groups of the virus are to be seen in the fluid when the cells have broken down.

As in the human patient, *pneumonia* is not a regular symptom of the disease in the experimental animal.

In the intraperitoneally infected mouse a lung affection is only observed occasionally. In early stages circumscribed red spots which resemble infarcts are found; microscopically these spots, and sometimes larger areas, consist chiefly of hæmorrhages into the alveolar walls, which compress the alveoli. In later stages an entire lobe or even one complete side may be transformed into a dark red, liver-like organ which suggests a genuine pneumonia; but the microscopical examination reveals that the alteration represents a collapse of the empty alveoli caused by hæmorrhages and œdema with accumulation of cells in the alveolar walls. Apparently this lung condition arises from the blood-vessels, where the virus attacks and destroys the endothelial cells.

To sum up, the essential characteristic of psittacosis is the infection and the destruction of the reticulo-endothelial system.

THE CAUSAL AGENT

The ætiological agent of the disease is a filter passer, as Bedson, Western, and Simpson reported first in January, 1930, and as many investigators confirmed at the very beginning of their researches during the pandemic of 1930. Thus the former "bacillus psittacosis" of Nocard (1892) and the different bacteria more recently described as the causal agent may be discarded definitely as ætiological factors. Very soon, however, it became evident that the filtrability of the psittacosis virus is rather limited. Only the more porous types of filter candles such as Chamberland L2 and Berkefeld V allow the virus to pass. In complete agreement with these filtration experiments are the observations with centrifugation; even a short spinning at relatively low speed diminishes appreciably the degree of infectivity of the supernatant fluid (Levinthal), and a high-speed centrifugation for a prolonged time deprives the supernatant fluid almost completely of the virus, which is concentrated in the deposit (Bedson and Western). Both the results of filtration through filter candles and of centrifugation indicated that the virus is of considerable size. At the National Institute for Medical Research I found an excellent opportunity to define more exactly the minimum size of the virus particles. Mr. Elford kindly placed his filtration arrangements at my disposal. By means of his carefully calibrated "gradocol" membranes the minimum size of the psittacosis virus was determined as 0·22–0·33 μ.

This result proves that the causal agent of psittacosis must be within the limit of microscopical resolution. Indeed, it corresponds exactly to the microscopical observations which were first published in the spring of 1930, and have been confirmed since then by nearly all investigators who have studied the disease. At a meeting of the Berliner Microbiologische Gesellschaft on March 24th, 1930, I reported the discovery of minute coccoid bodies in exudates and in certain infected organs, and described shortly afterwards the extraordinary pleomorphism of the germ, which strikingly resembles that of *B. tularense*. R. D. Lillie (April 11th, 1930) described the same structures and compared them with rickettsia. A. C. Coles (THE LANCET, 1930, i., 1011) was the first to report the same micro-organisms in blood-films of human cases. Bedson and J. O. W. Bland thoroughly studied during the following years the development of the micro-organisms and favoured for a period the hypothesis, that this virus is not a bacterium, but possesses protozoal affinities with a developmental cycle of amœboid forms or plasmodium, morula, division and subdivision of elements of morula, elementary bodies; but recently they have withdrawn this hypothesis and agree with the opinion that this virus is a micro-organism with bacterial affinities.

The general confirmation of the findings and the satisfaction of nearly all investigators as to the nature of the bodies leaves scarcely room for any doubt about the ætiological significance of the structures. Nevertheless, I endeavoured to make the final conclusive step according to the postulates of Henle and Robert Koch, that is, to obtain a pure culture capable of subculture in any series and to test the virulence of the cultivated virus. The first success in obtaining multiplication in an artificial medium (modified Maitland medium) was reported in 1930 at the 1st International Microbiological Congress (Levinthal). Since 1932 Bedson and Bland have studied the growing of the virus bodies in explanted pieces of mouse spleen and chicken embryo. Since, January, 1934, I have been able to cultivate several strains† in a medium, similar to the medium of C. P. Li and Rivers for the cultivation of vaccinia and louping ill virus.

A small amount of thoroughly minced tissue of a 9 to 11 days old chicken embryo is suspended in 5 c.cm. tyrode solution in Carrel flasks. This medium yields an abundant growth after incubation for 3–4 days after inoculation, and this is easily subcultured by the transference of one drop of the ground-up tissue particles to freshly prepared flasks. Any of these well-grown cultures, if tested on the mouse, shows an undiminished virulence of the virus—

† Mentioned in the report of the Medical Research Council for the year 1933–34. January, 1935, p. 38.

that is, an infectivity still in dilutions of 10^{-8}. Moreover, the cultures offer an excellent material for watching the development of the micro-organisms during the different periods of cultivation by means of suitably prepared and stained specimens, which reveal again the remarkable pleomorphism of the virus.

The multiplication occurs exclusively in the surviving tissue, preferably within the endothelial and epithelial cells; only after the breaking up of the degenerating cells do the virus bodies become free and appear in the fluid. In a freshly prepared medium the virus is mainly found in the form of deeply staining cell inclusions varying much in size and shape, which, if broken up by force during the preparation, crumble to irregular pieces. These inclusions are similar in nature to the cytoplasmic inclusion bodies of other virus diseases, but with the difference that the matrix of the inclusion body is basophilic, as Bedson and Bland rightly emphasise. Later on these inclusion bodies are more and more replaced by intracellular colonies of all sizes, composed of the distinct and separate minute virus bodies. These two extremes, and all kinds of intermediate forms, are to be seen often enough at the same time.

It seems to me evident that this pleomorphism depends upon the environmental factors. When the virus invades a healthy, vigorous cell, an immediate multiplication is hampered by unknown factors. The virus passes through a latent period, during which division is checked. The virus particles swell up and form a mass embedded in a deeply stainable matrix, which obscures all detail. This enlargement may be due to the accumulation of nutriment in the virus particles. The result is a typical inclusion body. Later, when the host-cell weakens more and more as shown by the progressive vacuolisation of the cytoplasm and the karyopyknosis, unbounded growth of the virus is able to take place. Division then commences and an intercellular colony is formed, composed of distinct elements, which become more and more uniform and minute, until the whole of the cell is packed with these bodies and finally bursts.

When on the other hand the virus encounters a considerably damaged cell, a prompt and unchecked multiplication leads to the immediate formation of such colonies, which, from the initial stage, are composed of the minute and distinct elements. As an intermediate stage there occur small colonies composed of distinct cocci and diplococci nearly as large as staphylococci, but without any matrix.

In my opinion these larger forms are not a regular initial stage of the virus, as Bedson and Bland still believe. They are forms, developing whenever the ratio between nutrition and multiplication is temporarily disturbed. Moreover, if this virus is indeed a minute bacterium, multiplying by simple division, there cannot exist an "initial" stage and the words young or old lose any significance.

Finally, still another morphological group has to be mentioned, more conspicuous in infected animals than in cultures. This is obviously an involution or degenerative form, swollen up and pale, appearing sometimes as rings, sometimes as large discs, sometimes as barrel-shaped rods with bipolar staining, resembling very thick pasteurellæ.

The demonstration of this organism in any one of its typical forms must be the conclusive point in every definite diagnosis of the disease. The multiformity of the psittacosis virus seems to me the most characteristic feature of the microbe. The cultivation and the reproduction of the disease by the pure culture prove beyond doubt the ætiological significance of the micro-organism. The behaviour of the virus in the preparations of infected organs and the observation of the growing culture, together with the filtration experiments, reveal the characteristic attributes of a minute bacterium. All these facts warrant the name I have given to the microbe and published in 1930: *Microbacterium multiforme psittacosis.*

In addition, it may be mentioned briefly that I have attempted to immunise mice by active vaccination. The vaccines were prepared in various ways and injected intraperitoneally several times. The addition of a small amount of formalin or the photodynamic inactivation of the virus by the method of Perdrau and Todd with methylene-blue and radiation proved to be very effective. The treated mice became immune against a ten-million-fold lethal dose of the virus.

This work has been carried out under a grant of the Rockefeller Foundation. I wish to express my thanks to the Medical Research Council and Sir Henry Dale, F.R.S., for the opportunity of continuing my researches at the National Institute. My thanks are also due to Captain S. R. Douglas, F.R.S., Mr. W. J. Elford, Ph.D., and to the medical staff of the Ministry of Health.

CARDIAC MENSURATION

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There is no need to-day to stress the importance of radiology in the diagnosis of pulmonary disease. Chest radiograms have reached a perfection scarcely dreamed of ten or fifteen years ago, when all the radiologist could do after studying a thoracic plate was to hazard a guess as to the presence or absence of gross disease. But it must be confessed that the investigation of the heart by radiological means has not reached an equal state of perfection. This is the more surprising when we consider that a fluid-filled thick-walled organ like the heart, situated in the centre of a chamber largely filled with air, should be an ideal subject for the radiologist. It is true that X ray methods have been employed in cardiac examination, and orthodiagraphy has been, and still is, extensively used for the purpose. But this method has several disadvantages, and in my opinion the teleradiogram offers decided advantages over the older method.

The methods which can be utilised in the X ray examination of the heart are fluoroscopy, orthodiagraphy, "barium swallow" examination, and teleradiography in the erect or prone position. In this paper only the last will be considered.

METHOD OF PRESENT INVESTIGATION

In the X ray department of any chest hospital a large number of routine X ray examinations are made, some of them for the examination of the lungs and some of them on heart cases, and a method for accurate estimation of the heart's size and the size of its different chambers would therefore be very useful in the elucidation of the cases seen. To find out whether an accurate standard of heart measurement could be obtained, a large number of chest radiograms of apparently normal cases were studied, using first the method described by Vaquez and Bordet, which is at present used in orthodiagraphic

mensuration, and secondly Levine and Reid's modification of this method. It became obvious that there was inaccuracy in the measurements due to an inability to fix any point on the left border of the heart in the pulmonary artery region. The classical system of measurement was therefore modified, and only three fixed points were used. They are :—

(1) A point on the right border of the heart, where there is always a distinct notch at the level of origin of the ascending part of the aortic arch.

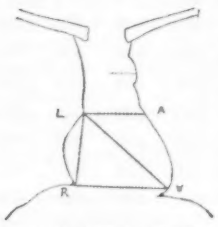

FIG. 1.—Explained in text.

(2) The right cardiophrenic angle where a small triangle formed by the right dome of the diaphragm, the right auricle, and the inferior vena cava is visible.

(3) The point at which a line is drawn horizontally across from the right cardiophrenic angle cuts the left border of the heart.

These are shown in Fig. 1 as L, R, and V. Lines are drawn between them so as to form a triangle LRV, and another line is drawn horizontally across from L to the left border of the heart, giving a fourth point A. We have now four possible measurements all based on points which can be accurately determined in a good radiogram.

ANATOMICAL CONSIDERATIONS

Dissections of the thorax were studied and also a frozen section of the cadaver, at the level of the origin of the aorta and pulmonary artery, in order to discover the structures included in the measurement LA. The superior vena cava, aorta, and pulmonary artery are here situated, anteriorly in this order from right to left, and posterior to them is the left auricle, whilst the left auricular appendix curves forwards round the base of the pulmonary artery. LA is therefore a composite measurement and includes all these structures. Of the remaining measurements LV runs across the origin of the aorta and the right and left ventricles, and gives indication of the size of the left ventricle; RV is related to the right and left ventricles, and increases if either of them be enlarged, whilst RL is related to the right auricle.

Obviously it is better not to regard the measurements as representing the structures anatomically, but simply as a geometrical pattern, which can be measured on any radiogram accurately. The size of the aortic arch, as shown in the anterior radiogram, can be obtained by drawing a perpendicular from the midline of the vertebral column to the greatest convexity of the aortic knob.

These measurements are of little value in themselves unless they can be related in some way to the size of the chest. One obvious way is to relate them to the transverse diameter of the chest. This has already been utilised in the so-called cardio-thoracic ratio, which gives the relation of the transverse diameter of the heart to the transverse diameter of the chest. In order to test its utility we measured one hundred apparently normal chest radiograms, utilising the measurements just described, and we then plotted a graph for each measurement, using the transverse diameter of the chest as the ordinate and each measurement in turn as the abscissa. It was then found that many of the measurements gave considerable variations, amounting in the case of LA to as much as a 3 cm. variation for any given diameter of the chest. This was of course very unsatisfactory, and it was decided to introduce a second measurement for the chest—namely, a longitudinal diameter, obtained by drawing a line at right angles to the transverse diameter from a point R at the right cardiophrenic angle to the level of the disc between the bodies of the second and third dorsal vertebræ (see Fig. 2). These two measurements, when multiplied together, give an estimate of the area of the projection of the chest in the radiogram. A further hundred normal radiograms were therefore examined, using the area expressed in square centimetres as an index, and when the graphs were plotted out it was found that the variation between the maximum and minimum sizes of LA for any given index was now approximately 1·8 cm. This is thus a more accurate method of cardiac mensuration. A table of measurements was obtained for radiograms taken in the prone position and also for the erect position (see below Tables II. and III.). They should be used as follows :—

The area of the chest in square centimetres is first obtained, the transverse diameter being measured at the level of point R, as shown in Fig. 2. The amount, which can be quickly calculated by using Table I., is compared with the figures at the heads of the columns in Table II. for the prone position, or Table III. for the erect position. If the area is found to be 500 sq. cm. in the prone position, then the average measurements are read off as follows :—

Ao	2·8	LV	13·2
Trans. diam. ..	12·0	RV	10·9
LA	7·6	RL	7·9

For an adult chest the normal variation above or below these figures is 0·5 cm. for the aortic measurement, and 0·9 cm. for LA, LV, and RV. Any variation above this should be regarded as abnormal. The figures will not be accurate unless R and L are placed at the correct distance from one another. This should be constant for each size of chest. In the example given the area of the chest was found to be 500 sq. cm. Point L must therefore be placed exactly 7·9 cm. above R as given in the Table, before the other measurements shown in Fig. 1 are marked out.

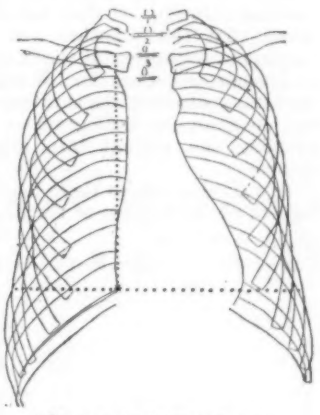

FIG. 2.—Explained in text.

Consideration of Tables II. and III. shows that all the measurements increase uniformly in relation to the surface area of the chest as seen in the radiogram. The diameters in the erect position are less than in the prone. The average difference is 0·8 cm. for the transverse diameter, 0·9 cm. for LA, and 0·5 cm. for LV.

Since we are dealing with a method which is only accurate if the routine picture is taken by a precise technique, it is perhaps as well to emphasise the following points :—

(*a*) The tube should be six feet from the film. (If the focal film distance is four feet the diameters will show an increase of approximately 6 mm.)

(*b*) The patient must be in the correct position with the shoulders and clavicles squarely on the plate and there must be no deviation into either of the oblique positions.

(*c*) The exposure must be made in full inspiration and should be as short as possible in order to avoid heart

TABLE I.—(FOR RAPID MULTIPLICATION OF THE TRANSVERSE AND LONGITUDINAL DIAMETERS)

Longitudinal diameter	*Transverse diameter*																
	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
15	150	165	180	195	210	225	240	255	270	285	300	315	330	245	260	275	290
16	160	176	192	208	224	240	256	272	288	304	320	336	352	368	384	400	416
17	170	187	204	221	238	255	272	289	306	323	340	357	374	391	408	425	442
18	180	198	216	234	252	270	288	306	324	342	360	378	396	414	432	450	468
19	190	209	228	247	266	285	304	323	342	361	380	399	418	437	456	475	494
20	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520
21	210	231	252	273	294	315	336	356	378	399	420	441	462	483	504	525	546
22	220	242	264	286	308	330	352	374	396	418	440	462	484	506	528	540	562
23	230	253	276	299	322	345	368	391	414	437	460	483	506	529	552	575	598
24	240	264	288	312	336	360	384	408	432	456	480	504	528	552	576	600	624
25	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600	625	650
26	260	286	312	338	364	390	416	442	468	494	520	546	572	598	624	650	676
27	270	297	324	351	378	405	432	459	486	513	540	567	594	621	648	675	702
28	280	308	336	364	392	420	448	476	504	532	560	588	616	644	672	700	728
29	290	319	348	377	406	435	464	493	522	551	580	609	638	667	696	725	754
30	300	330	360	390	420	450	480	510	540	570	600	630	660	690	720	750	780

movement. If the exposure is more than one-tenth of a second the heart outline, especially on the left border, is liable to be blurred.

If all these details have been carefully attended to it will be seen on examining the film that the right dome of the diaphragm lies between the tenth and eleventh ribs at its point of maximum convexity, whilst the left dome is at a slightly lower level.

The clavicles are horizontal and their inner ends should be exactly equidistant on each side of the vertical column. If they are not equidistant, it will mean that the exposure has been made with the patient in a position of slight rotation unless scoliosis is present (see Case 2). When the scoliosis is of a moderate degree, mensuration can still be carried out on a routine radiogram or on a film taken after rotating the patient into alignment under screen control.

In valvular lesions there may be (1) changes in the outline of the borders of the heart, of which the most important is the left border; and (2) changes in the relations of the different measurements to each other.

(1) *Outline of the heart.*—The changes in outline caused by single valvular lesions are moderately well known, and a description of them is given in some of the more recent test books. Figs. 3 and 4 show tracings of the heart outline in mitral disease and in aortic disease, and it will be seen that whereas in mitral disease there is a convexity below the aortic knob, in aortic disease there is a concavity. A study of these outlines, which seem to be reproduced regularly in a radiogram, enables the type of valvular lesion to be determined with considerable accuracy in a simple case.

FIG. 3.—Early mitral stenosis.

TABLE II.—*Average Heart Measurements at Six Feet Prone*

Area in sq. cm. (LT × TD)	150	175	200	225	250	275
Ao.	1·4	2·0	2·1	2·1	2·2	2·2
Trans. diam.	8·6	8·8	9·1	9·3	9·5	9·8
LA	5·4	5·5	5·7	5·9	6·0	6·2
LV	9·3	9·6	9·9	10·2	10·4	10·7
RV	7·9	8·1	8·3	8·5	8·7	8·9
RL	5·1	5·3	5·5	5·7	5·9	6·1

	300	325	350	375	400	425
Ao.	2·2	2·3	2·3	2·4	2·5	2·6
Trans. diam.	10·0	10·3	10·5	10·8	11·0	11·3
LA	6·3	6·5	6·6	6·8	7·0	7·1
LV	10·9	11·2	11·5	11·8	12·1	12·4
RV	9·2	9·4	9·6	9·8	10·0	10·3
RL	6·3	6·5	6·7	6·9	7·1	7·3

	450	475	500	525	550	575
Ao.	2·7	2·7	2·8	2·8	2·8	2·9
Trans. diam.	11·5	11·8	12·0	12·3	12·5	12·8
LA	7·3	7·4	7·6	7·7	7·9	8·0
LV	12·6	12·9	13·2	13·5	13·8	14·1
RV	10·5	10·7	10·9	11·1	11·4	11·6
RL	7·5	7·7	7·9	8·1	8·3	8·5

	600	625	650	675	700	725
Ao.	3·0	3·1	3·1	3·2	3·2	3·2
Trans. diam.	13·0	13·3	13·6	13·9	14·1	14·3
LA	8·1	8·3	8·4	8·6	8·7	8·8
LV	14·4	14·7	15·0	15·2	15·5	15·7
RV	11·8	12·0	12·2	12·4	12·7	12·9
RL	8·7	8·9	9·1	9·3	9·5	9·7

TABLE III.—*Average Heart Measurements at Six Feet Erect*

Area in sq. cm. (LT × TD)	150	175	200	225	250	275
Ao.	1·7	1·8	1·9	2·0	2·0	2·1
Trans. diam.	8·0	8·2	8·4	8·6	8·9	9·1
LA	4·5	4·7	4·9	5·0	5·2	5·4
LV	8·8	9·1	9·4	9·7	10·0	10·2
RV	7·4	7·6	7·8	8·0	8·2	8·4
RL	5·1	5·3	5·5	5·7	5·8	6·0

	300	325	350	375	400	425
Ao.	2·2	2·2	2·3	2·3	2·3	2·4
Trans. diam.	9·3	9·6	9·8	10·0	10·3	10·5
LA	5·5	5·7	5·8	6·0	6·1	6·3
LV	10·5	10·8	11·1	11·4	11·6	11·9
RV	8·6	8·8	9·0	9·2	9·4	9·6
RL	6·2	6·4	6·6	6·8	7·0	7·2

	450	475	500	525	550	575
Ao.	2·4	2·4	2·5	2·6	2·6	2·7
Trans. diam.	10·7	10·9	11·2	11·4	11·6	11·9
LA	6·4	6·6	6·7	6·9	7·0	7·2
LV	12·2	12·5	12·8	13·1	13·3	13·6
RV	9·8	10·0	10·2	10·4	10·6	10·8
RL	7·4	7·6	7·8	8·0	8·2	8·4

	600	625	650	675	700	725
Ao.	2·8	2·9	2·9	2·9	3·0	3·0
Trans. diam.	12·1	12·3	12·5	12·8	13·0	13·2
LA	7·4	7·5	7·7	7·8	8·0	8·1
LV	13·9	14·2	14·5	14·7	15·0	15·3
RV	11·0	11·2	11·4	11·6	11·8	12·0
RL	8·6	8·8	9·0	9·2	9·4	9·6

(2) *Relation of the different measurements to each other.*—If the measurement LV is divided by the measurement LA an index LV/LA is obtained, which is of some value in differential diagnosis. In normal radiograms it varies between 1·7 and 2·0 in the erect view, and 1·6 and 1·9 for the prone position. Where a mitral valvular lesion is present the ratio is reduced, since the relative value of LA increases with enlargement of the left auricle and pulmonary artery. In extreme cases it may be as low as 1·3. When the aortic valve is also involved the ratio tends to have a normal value. The following list shows the alterations of the index found in different heart lesions :—

Aortic stenosis	Normal
Aortic regurgitation	Normal
Mitral stenosis	Reduced
Mitral stenosis with aortic disease ..	Normal or slightly reduced
Mitral stenosis with tricuspid disease	Reduced
Pulmonary stenosis	Reduced

A study of the heart outline and the figures obtained by mensuration enables us in many cases to decide from the radiogram what valve or valves are diseased.

The position may be summarised as follows :—

Mitral disease (Fig. 3).—There is a prominence on the left border of the heart below the aortic knob, which increases with the development of stenosis of the valve. In advanced cases the outline of the left auricle is seen on the right border of the heart and encroaches on the root of the aorta. LA is increased and the ratio LV/LA diminished to 1·5 or less. Increase of the lung markings from congestion is frequently seen. A radiogram taken in the first oblique position will show the dilated left auricle.

Aortic valvular disease (Fig. 4).—The left ventricle is enlarged and protrudes downwards and outwards. The left border of the heart in the auricular region tends to be concave. LV and RV are increased and the ratio LV/LA is normal. Changes in the outline of the aortic arch can be confirmed by a radiogram taken in the second oblique position.

Mitral stenosis with aortic disease.—The heart outline usually resembles that seen in mitral stenosis. All the measurements are increased. The ratio LV/LA is normal or slightly reduced.

Congenital heart.—I have refrained from discussing the numerous forms of congenital heart disease, as the exact lesion is so seldom established with certainty ante mortem. If the pulmonary artery is enlarged the shape of the heart has some resemblance to that seen in mitral stenosis, the measurement LA is increased in size and the ratio LV/LA falls to 1·5 or less. An example of the outline seen in pulmonary stenosis is shown in Fig. 4.

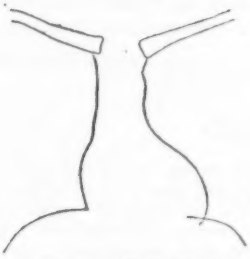

FIG. 4.—Early aortic valvular disease.

FIG. 5.—Mitral stenosis with tricuspid regurgitation.

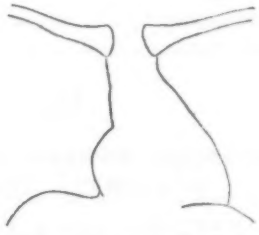

FIG. 6.—Pulmonary stenosis.

ILLUSTRATIVE MEASUREMENTS

NORMAL CASES

CASE 1.—Female, aged 26. Routine chest radiogram to exclude pulmonary tuberculosis.

Erect.			
TD	..	25·0	
LD	..	19·8	
TD × LD	..	495	
		Normal.	
Ao.. ..	..	2·2	2·5 —0·3
Trans. diam.	..	11·6	11·2 +0·4
LA ..	..	7·2	6·7 +0·5
LV ..	..	12·9	12·8 +0·1
RV ..	..	10·4	10·2 +0·2
LV/LA ..	..	1·79	1·7 —2·0
Prone.			
TD ..	..	25·5	
LD ..	..	19·0	
TD × LD	..	485	
Ao.. ..	..	2·5	2·8 —0·3
Trans. diam.	..	12·3	12·0 +0·3
LA ..	..	7·8	7·6 +0·2
LV ..	..	13·3	13·2 +0·1
RV ..	..	10·8	10·9 —0·1
LV/LA ..	..	1·70	1·6 —1·9

The measurements are close to the average, both in the erect and in the prone positions.

CASE 2.—Male, aged 33. To show the effect of rotation. Radiograms were obtained with the patient straight and also after rotating him slightly to the right and left oblique positions.

Erect.		
TD ..	..	29·0
LD ..	..	23·0
TD × LD	..	667

Patient straight.		Normal.	Right oblique position.	
Ao ..	.. 3·1	2·9	Ao ..	.. 3·0
Trans. diam.	.. 12·6	12·6	Trans. diam.	.. 12·9
LA ..	.. 8·6	7·8	LA ..	.. 8·5
LV ..	.. 14·7	14·6	LV ..	.. 14·9
RV ..	.. 11·7	11·6	RV ..	.. 11·5

Left oblique position.	
Ao	3·4
Trans. diam.	12·6
LA	8·3
LV	15·0
RV	11·7

The aortic measurement is diminished in the first oblique position and increased in the second. The other measurements show some alteration, LV being relatively increased and LA diminished in the oblique positions.

VALVULAR LESIONS

CASE 3.—Female, aged 5 (Fig. 3).

Prone.			
TD ..	..	20·5	
LD ..	..	11·9	
TD × LD	..	245	
		Normal.	
Trans. diam.	..	9·4	9·3 +0·1
LA ..	..	7·1	6·0 +1·1
LV ..	..	10·4	10·3 +0·1
RV ..	..	8·8	8·7 +0·1
LA/LV ..	..	1·47	1·60 —1·90

LV and the transverse diameter are within 1 mm. of the normal, LA is increased by 1·1 cm. and the LV/LA ratio is diminished. If the transverse and longitudinal diameters of the heart only were measured, the abnormality would be missed.

The X ray diagnosis was mitral stenosis, which was in agreement with the clinical findings.

CASE 4.—Male, aged 14½ (Fig. 4).

	Prone.		
TD	23·5		
LD	16·2		
TD × LD ..	375		
		Normal.	
Ao	2·3	2·4	−0·1
Trans. diam. ..	12·0	10·8	+1·2
LA	6·5	6·8	−0·3
LV	12·9	11·8	+1·1
RV	11·2	9·8	+1·4
LV/LA	1·89	1·60	−1·90

The left border of the heart is concave below the aortic knob. The left ventricle is prominent. The transverse diameter, LV, and RV are increased more than 1 cm. The ratio of LV : LA is normal. The radiological diagnosis was aortic disease, which agreed with the clinical findings.

CASE 5.—Male, aged 27 (Fig. 5).

	Prone.		
TD	28·2		
LD	19·7		
TD × LD ..	555		
		Normal.	
Ao	—	—	
Trans. diam. ..	16·5	12·5	+4·0
LA	12·1	7·9	+4·2
LV	17·6	13·8	+3·8
RV	15·0	11·4	+3·6
LV/LA	1·45	1·60	−1·90

Gross cardiac enlargement. The ratio of LV : LA is diminished to 1·45. Diagnosis: mitral stenosis with tricuspid regurgitation. Confirmed by autopsy.

CASE 6.—Female, aged 30 (Fig. 6).

	Erect.		
TD	23·8		
LD	16·2		
TD × LD ..	385		
		Normal.	
Ao	2·3	2·4	−0·1
Trans. diam. ..	12·5	10·2	+2·3
LA	8·4	6·0	+2·4
LV	13·0	11·5	+1·5
RV	11·7	9·3	+2·4
LV/LA	1·55	1·7	−2·0

The outline of the heart is similar to that seen in mitral stenosis. It can be distinguished from mitral disease by the absence of enlargement of the left auricle. The radiological diagnosis of pulmonary stenosis agreed with the clinical findings.

I should like to take this opportunity of acknowledging the valuable assistance received from my colleagues at the Victoria Park Chest Hospital.

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CLINICAL AND LABORATORY NOTES

POSTERIOR INFERIOR CEREBELLAR AND VERTEBRAL THROMBOSIS

BY F. HOLT DIGGLE, O.B.E., M.B. Vict., F.R.C.S. Eng.

HON. LARYNGOLOGIST, ANCOATS HOSPITAL, MANCHESTER; AND

JOHN S. B. STOPFORD, M.D. Vict., F.R.S.

PROFESSOR OF ANATOMY IN THE VICTORIA UNIVERSITY OF MANCHESTER

THE interesting case of posterior inferior cerebellar thrombosis recorded by Prof. Hall and Dr. Eaves [1] prompted one of us to unearth records of a similar, though more diffuse, thrombosis.

CASE RECORD

A male, aged 76, suffering from complete dysphagia with pain and tenderness over the larynx and pharynx and constant cough from the irritation of unswallowed saliva, was seen in consultation and admitted to Ancoats Hospital on Oct. 22nd, 1929.

History.—During the previous two weeks several teeth had been extracted at intervals, the last extraction being performed five days before admission to hospital. There was no history of having swallowed a foreign body or bolus of unmasticated food. On Oct. 20th he noticed during the night that he was unable to swallow his saliva. This had continued up to the present time. He complained of pain over the pharynx, larynx, and trachea which was increasing. On Oct. 21st breathing was said to be "throaty" and phonation difficult.

Previous medical history.—Five years ago he was under the care of his own doctor with slight fits occurring about every three months, which in time disappeared. He had a paralysis once and this was most marked on the right side of the body.

Condition on admission (Oct. 22nd).—There was complete inability to protrude the tongue, accompanied by slurring of speech, and he was unable to swallow liquids. He complained of some tenderness over the larynx and trachea, and a constant cough, caused by the accumulation of saliva in the pharynx. There was complete paralysis and anæsthesia of the soft palate, paralysis of both sides of the tongue and bilateral pharyngeal constrictor paralysis, but the larynx was normal, the true vocal cords presenting perfect abduction and adduction. Owing to the patient's condition no further record of the state of the central nervous system was possible, but it is stated that the pupils reacted normally to light and accommodation. Blood pressure: systolic, 155; diastolic, 85. Wassermann reaction negative in a dilution of 1 in 5: urine, specific gravity 1015; acid; albumin +, acetone a trace.

Further progress.—Oct. 24th: patient appears worse. Fed yesterday with stomach-tube; appears too weak for this to-day. Respirations 36. Oct. 25th: patient seems slightly better; can now protrude tongue slightly, speech improved and he can be understood. Has had two feeds of a pint of milk by stomach-tube early to-day. This evening patient has started to swallow again and managed to get one pint of milk down in sips. A soft œsophageal tube readily passes into the stomach.

The patient slowly sank and died on Oct. 27th.

During the course of the illness the temperature never rose above 99° F., the pulse varied from 110 to 140, and the respirations between 32 and 36.

EXAMINATION OF BRAIN AND ARTERIES

Histological examination of arteries.—Sections were made of the basilar, the right and left vertebral and the right and left posterior inferior cerebellar arteries. All showed marked atheromatous changes of long standing. Atheroma was not so pronounced in the basilar as in the other arteries, but was most profound in the right posterior inferior cerebellar, which showed a lumen largely occupied by thrombus. There was also some thrombotic material in the lumen of the right vertebral and the left posterior inferior cerebellar arteries, but in none of these was the channel completely occluded. From both naked-eye and microscopical examinations of the arteries there was evidence of recent thrombosis following long-standing atheroma and that this had led to serious interference with the blood-supply of the medulla.

Sections of medulla were cut at three levels and stained to show the condition of the nerve-cells. The hypoglossal nucleus and nucleus ambiguus on both sides showed pronounced changes. The cells as a whole were badly stained and showed marked chromatolysis. Whereas a

[1] Hall, A. J., and Eaves, Elizabeth, C.: THE LANCET, 1934, ii., 975.

few cells exhibited a fair number of Nissl's granules and a central nucleus, most of them were almost devoid of granules and the nucleus excentrically placed. In some the nucleus was absent and the cell evidently in a state of advanced disintegration. Many of the cells were shrunken and deformed.

The hypoglossal nucleus and the nucleus ambiguus seemed to be about equally affected on the two sides. The cells of the inferior olive stained much better and it was clear that the disturbance was chiefly in the retro-olivary region. There was clear evidence, also, that the upper part of the medulla had suffered more severely than the lower. The maximum effect was upon the upper parts of the hypoglossal nucleus and the nucleus ambiguus, and, to a lesser extent, on the upper parts of the dorsal vago-glossopharyngeal nucleus and the spinal nucleus of the fifth nerve on both sides. There was no evidence of softening or complete disintegration anywhere.

The histological appearances were consistent with the condition of the vessels and suggested an incomplete obstruction to the arterial supply of the upper medulla on both sides.

SUMMARY AND INTERPRETATION

In this case two things are clear from the pathological side:—

(1) There had been a long-standing and widespread atheroma of the intracranial vessels. This is evident from an examination of the vessels and the atrophic changes in the cerebral cortex, especially the frontal lobes.

(2) Recently thrombosis had occurred causing a "patchy" obstruction of the bulbar vessels with consequent changes in the medulla. The thrombotic material was most obvious in the lumen of both posterior inferior cerebellar arteries and the right vertebral, but histological sections showed a diffuse and widespread thrombosis in the finer intramedullary branches, especially in the upper part of the medulla.

On the anatomical side we have:—

(1) Profound changes in the cells of the hypoglossal nucleus and nucleus ambiguus on both sides. The severity of the lesion is about equal on the two sides.

(2) The disturbance is chiefly in the retro-olivary region and the upper medulla has suffered more than the lower.

(3) Whilst it is easier—owing to the larger size of the cells—to estimate the extent of the damage to the hypoglossal nucleus and the nucleus ambiguus, there is evidence which suggests that other nuclei in the retro-olivary region (such as the spinal nucleus of fifth nerve and the dorsal vago-glossopharyngeal nucleus) have not suffered so severely.

(4) The anatomical localisation is, on the whole, consistent with the pathological and clinical findings.

The long-standing character of the arterial changes and the patchy nature of the thrombosis demand great care in interpretation. It is not a clear-cut focal lesion from which we can deduce with confidence.

The most interesting points have reference to the nucleus ambiguus. The hinder part of this, which gives origin to the accessory portion of the spinal accessory nerve, has been called the laryngeal nucleus. This is because the accessory fibres join the vagus and later leave that nerve as the recurrent laryngeal branch which innervates all the intrinsic muscles of the larynx, except the cricothyroid. The sections prove that it is the cephalic part of the nucleus ambiguus which has suffered most, and the clinical report shows paralysis of the palate and pharyngeal muscles but not laryngeal muscles, which is consistent with escape of laryngeal nucleus (caudal part of nucleus ambiguus).

The arterial lesion is patchy and incomplete. We think this accounts for the fact that the nuclei appear to have suffered more than fibre tracts and also for the fact that there is no softening or complete disintegration. It may account for the absence of pupillary signs which are common in retro-olivary lesions.

Some disturbance of taste would be expected, but it was not possible to test this satisfactorily and therefore reference to it cannot be made. Paralysis of the tongue is accounted for by the bilateral lesion of the hypoglossal nucleus.

A dissociated sensory loss is almost the rule in such cases, but, owing to the condition of the patient, a satisfactory examination could not be made.

Lastly, it is difficult to explain the pain and tenderness over the larynx unless it is a manifestation of the involvement of the sensory tracts in the medulla. Its limited localisation makes such a suggestion a little unconvincing.

FRACTURED SPINE WITH FÆCAL INCONTINENCE

BY HAROLD DODD, M.Ch. Liverp., F.R.C.S. Eng.

SURGEON TO KING GEORGE HOSPITAL, ILFORD; SURGEON TO ROYAL HOSPITAL, RICHMOND

ON August 18th, 1934, Mr. A fractured his spine in a motor accident, the body of the first lumbar vertebra and transverse processes of the second and third on the left side being involved. He was admitted to a hospital (600 beds), where he lay on his back for five weeks without a splint or other method of immobilisation. During this time he was incontinent of fæces; it was dealt with by placing at the bedside a bedpan, which he passed beneath him when he felt wet. In the sixth week he was allowed up, and on Sept. 26th he returned home. He was able to shuffle comfortably, but could not lift his feet clearly from the floor. He had no control of his sphincter ani.

His doctor referred him to me with two queries: (1) When could he start work? (2) Did he need a spinal support?

The man protested that he was well, being keen to return to duty; he had a wife and three children. On inquiring about the action of his sphincters he admitted his fæcal incontinence. He entered hospital, where he was nursed on his face. His rectal sense and control returned immediately, but disappeared when he was turned on his back in order to use the bedpan, as the bowels acted before the receptacle could be introduced.

On Oct. 8th a Watson Jones plaster spinal jacket was applied; the result was immediate—his incontinence disappeared entirely. After a week he got up and was discharged home. For four or five days the incontinence returned while he was on his feet, but not when he was sitting or lying down (apparently the jacket did not completely fix the spine). During the following week the bowels acted three to four times a day, but rectal sense and control were established. The diarrhœa settled without treatment, and was succeeded the next week by pruritus ani, which disappeared with toilet measures.

He started work on Dec. 4th, but after four days he developed erysipelas at his right ear. He was admitted to another hospital, and it subsided. He restarted work on Jan. 14th, 1935, since when he has continued in good health. The plaster is still in position, that is, after six months. It is softening but is comfortable. It is to be replaced shortly by a light spinal support.

The case is reported for two reasons: (1) on account of its interest, incontinence being relieved by nursing on the face—that is, in extension. (2) Because it

supports the method of treatment of a fractured spine so ably described and urged by Mr. Watson Jones.

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VOLVULUS OF THE SMALL INTESTINE HERNIATED THROUGH AN ABNORMAL ORIFICE IN THE MESENTERY

BY Y. CANTIN, M.R.C.S. Eng.

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A YOUNG Mahomedan shopkeeper, aged 27, was admitted to the Civil Hospital, Port Louis, on August 28th, 1934.

At about 11 A.M. on the previous day, immediately after his morning meal, he had been seized with violent pain in the lower abdomen, and an urgent but ineffectual desire to empty his bowel. He vomited his meal, but the pain, severe and intermittent, persisted throughout the day. An enema was administered to him in the afternoon, and some fæcal material but no flatus was returned. He vomited twice during the night, and was seen the next morning by a medical practitioner, who diagnosed perforation of the appendix, and advised his immediate removal to hospital.

On admission (about 24 hours after the onset of his illness) his condition was as follows. Body covered with clammy sweat; tongue moist, but features drawn and anxious. Pulse 140, poor; temperature, 37°C. (98·6° F.). Lower abdomen distended and not moving well with respiration. No rigidity, but diffuse tenderness over lower abdomen. No visible peristalsis. No borborygmi heard on auscultation. Liver dullness present.

On rectal examination some tenderness in Douglas's pouch.

There was a strong smell of acetone in the breath, and analysis confirmed the presence of acetone and of glucose in the urine (66 g. per litre). Twenty units of insulin were injected immediately, and shortly afterwards 20 c.cm. of 20 per cent. saline solution intravenously as a peristaltic stimulant. This probably initiated reverse peristalsis, for the patient immediately vomited bright green material. The acuteness of the onset, coupled with ineffectual tenesmus, suggested the possibility of a volvulus, and immediate laparotomy was decided upon.

The patient's condition, rendered still more precarious by the associated diabetes, led us to use local infiltration anæsthesia rather than give a general anæsthetic. Hyoscine hydrobrom. gr. 1/100 and morphia gr. 1/6 were injected as premedication, and after infiltration of the abdominal wall with 1/200 novocain a median subumbilical laparotomy was performed. As soon as the abdomen was opened, dark blood-stained serum welled out of the pelvis and gangrenous distended coils of the ileum came into view. The cæcum was felt to be empty. It was at first difficult to diagnose the exact cause of the obstruction, but on closer inspection a volvulus of the small intestine was discovered. The torsion was undone, and it was then found that the limbs of the loop emerged from a vertical slit, about 2½ in. long, in the mesentery, about 4 in. above the ileocæcal junction. The orifice was enlarged and the loop reduced. As the gut was not viable and the patient could not stand the resection of fully 2 ft. of gut, the affected loop was brought to the surface and drained, after stitching up the hole in the mesentery and the abdomen closed up. The patient died five hours after operation.

Hernia of the small intestine through an abnormal opening in the mesentery is rarer than its herniation through the transverse mesocolon. In a recent paper devoted to "Les hernies dites trans-mésocoliques," Ménégaux [1] was able to collect no less than 49 cases in which the ileum had often completely passed into the lesser sac through an opening in the transverse mesocolon. After reviewing the theories put forward to account for the existence of the abnormal opening—viz., perforation of a pre-existing peritoneal recess; trauma; fenestration during the process of development of a poorly vascularised zone of the mesocolon—Ménégaux sums up in favour of the last hypothesis as being the most satisfactory and as being also applicable to hernias of the ileum through an opening in the mesentery. In the case under review, the orifice did not correspond in situation to any of the peritoneal fossæ described in the neighbourhood of the cæcum, nor was there any history of trauma. Hence it is probable that the intra-abdominal pressure on the one hand and the aspiration exerted by the excursions of the diaphragm on the other led to the gradual ascent of a loop of ileum through a pre-existing orifice in the mesentery. This loop had secondarily undergone torsion, with resultant strangulation.

An almost exact replica of this case is to be found reported by Morestin in 1899 to the Société de Chirurgie and referred to by Lejars.[2] Morestin's patient however recovered; the gut was viable, and the surgeon confined himself to undoing the torsion and reducing the intestine through the hole in the mesentery.

[1] Ménégaux, G.: Jour. de Chir., 1934, xliii., 321.
[2] Lejars, F.: Chirurgie d'Urgence, Paris, 1921, vol. i., p. 434.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF OBSTETRICS AND GYNÆCOLOGY

THE meeting of the section held on May 17th was devoted to a discussion on

Diet in Pregnancy

Mr. EARDLEY HOLLAND, the president, who took the chair, said he had been anxious that this subject should be fully debated. He had always regarded it as one of first importance but it tended to be somewhat neglected by British obstetricians.

Dame LOUISE MCILROY said it had yet to be ascertained how best to feed a pregnant woman. Moreover, it was not easy to induce an interest in the problem. The two elements chiefly concerned, the mother and the ovum, ought to be as one; for the ovum should fit in with the metabolism of the mother, and the feeding should be the same for both; but there were warring elements, causing disease. When the ovum arrived in the uterus, the maternal metabolism became altered, even in the normal pregnancy. Nitrogen must be supplied for the enlarging uterus, and the demands of the fœtus would be met, even at the expense of the mother. In considering the mother's nutrition one must pay attention not only to what was ingested, but (even more important) to what was actually assimilated; it was always difficult to know why one woman easily assimilated the food she took, while another obviously assimilated only a portion. Another factor requiring notice was the placenta, which served as intermediary between mother and fœtus. From a study of metabolic aberrations one could work back to what was regarded as the normal, and the speaker believed

that the vomiting, toxæmia, and hæmorrhages of pregnancy, and puerperal sepsis would prove to be deficiency diseases, and that the solution of some of the problems they presented would be found in the larder and the kitchen rather than the laboratory or pharmacy.

Of nutritional requirements in pregnancy the first was water, and the pregnant woman should take at least three or four pints daily, preferably fresh rather than boiled. Milk was a valuable article of diet, and Dame Louise could not understand why there should be so much outcry about the destruction of vitamins by pasteurisation when so little attention was paid to the cooking of vegetables, and to the disadvantages of living on preserved fruits, tinned foods, and other artificial diets. During normal pregnancy glycogen was stored in large quantities, and if the intake was seriously deficient, proteins and fats were drawn upon, and there might be vomiting and ketosis. A loss of nitrogen took place in early pregnancy, and the greatest retention was during the fifth and sixth months. This storage served to compensate for the hæmorrhage which would occur at parturition, and for lactation. The nitrogen was derived from meat, eggs, and fresh vegetables. In the second half of pregnancy, however, meat should not be taken; among better-class patients there was usually over-eating at this time, and the effect of excessive protein diet had to be countered by open-air exercise, and by taking more carbohydrates. The intake of fats should also be low; the pregnant mother should be told to avoid fatty (especially fried) foods, and should be content with one egg a day. Of vitamins the most important here were A and D, and it was best to obtain them from fresh foods. If the mother were given too much vitamin D the fœtus would grow excessively, while in large quantities this vitamin had a very toxic effect. The fœtal blood contained more calcium than the maternal blood, and to ensure a sufficiency it was well to administer calcium in a chemical compound. In women complaining of cramp, backache, and insomnia, calcium sometimes gave dramatic results. Iron was another essential: it controlled vomiting, and was very useful for morning sickness.

The situation could be summarised as follows. The pregnant woman must have a good mixed diet of fresh foods, including raw fruits and vegetables, a medium supply of proteins, and a small supply of fat. Every pregnant woman should walk two miles a day. Mostly the woman's state of nutrition could be estimated by her general appearance and by periodic weighing. A woman who was overweight would probably also be toxic. In the last six months of pregnancy she should gain about 3 to 3½ lb. a month, or 16 to 18 lb. in the six months. Women should be taught food values, and how to buy and cook vegetables, avoiding expensive artificial and tinned foods; the latter were bought largely to save trouble.

Dr. G. W. THEOBALD said that according to the dietetic deficiency hypothesis all the toxæmias associated with pregnancy were caused by an absolute or relative insufficiency of some substance or substances in the diet, the most important being calcium, and this insufficiency led to an inharmonious working of the various physiological processes of the body, and ultimately to hepatic dysfunction. The implications were: (1) that the toxæmias of pregnancy could be prevented; (2) that there was no essential difference in the mode of causation of any of them; (3) that renal symptoms were merely incidental, the kidneys playing no part in the causation of the toxæmias; and (4) that there was no such thing as a pregnancy toxin. While it was true that extensive destruction of liver, kidneys, and other organs might be found in association with eclampsia, it was equally true that significant histological lesions might be absent in the organs of women dying of eclampsia; hence he concluded that gross structural damage was incidental, and not causally associated with eclampsia. Hepatic lesions could be caused by taking a high protein diet which was deficient in certain factors. Why should eclampsia be peculiar to the pregnant state? The fundamental difference between the pregnant and non-pregnant states was that the fœtus robbed the mother of important substances; indeed, the fœtus was a true parasite.

Prof. S. J. COWELL said that in the middle months of pregnancy the mother was storing calcium at a greater rate than the fœtus; it was only in the last months that the fœtus was taking more calcium than the mother. A colossal storage of calcium took place in the last month, and this accounted for premature children being so liable to develop rickets. Adequate calcium storage depended on a sufficient supply of calcium and phosphorus in the diet and a sufficient intake of vitamin D. Prof. Cowell referred to an American investigation in which 188 pregnant women were given extra calcium and vitamin D; among these there were 2 cases of toxæmia. But among 230 cases to whom these extras were not given 30 women developed toxæmia. As for the child there was much experimental evidence that calcium feeding during pregnancy helped normal calcification of bones and teeth. The simplest plan was to make use of the naturally rich source of calcium, milk, and it was highly desirable for the pregnant mother to drink at least two pints daily. Other rich sources were cheese and green vegetables. Egg-yolk was rich in vitamin D, and cod-liver oil was a valuable addition.

Dr. H. N. GREEN said it was not yet known exactly what part diet played in resistance to infection. Vitamin A was apparently of greatest importance in this connexion, and in pregnancy the demand for it was increased. It seemed clear that the vitamin-A reserves of the woman in pregnancy were often lower than in the normal adult, and the septic cases showed lower reserves than did the non-septic cases. It was difficult to decide whether the low vitamin-A reserve was a predisposing factor, or was merely an effect of the disease; it might even represent a physiological stage in the puerperium. It was reasonable to ensure a good supply of vitamin A in pregnancy by giving moderate doses of some liver oil when the appropriate foods were not available. Low vitamin-A reserves were probably associated with low reserves of other nutritional factors. An important fact was the possible toxic effect of liver oil concentrates in large doses; this could be neutralised by large amounts of vitamin B. It was recognised that ample reserves were no guarantee against infection, but optimum supplies of vitamin A during pregnancy would reduce liability to a morbid puerperium. The final assessment of the value of vitamin A could be made in a scientific investigation in a country such as India.

Dr. LUCY WILLS spoke on the nutritional anæmias in pregnancy. She divided her subject into nutritional anæmia due to deficiency in iron, and that due to the pernicious anæmia factor. The first of these was world-wide, the second was of great import-

ance in tropical countries. Most industrial populations in this country had a diet containing 0·01 g. of iron, and that sufficed to keep blood values up. But it was not enough for women who sustained repeated pregnancies; hence a low-grade anæmia was common among such women, not only of the very poor, but also of the more fortunate classes. In some stock-raising regions of South America, hyperchromic anæmia was common—especially where hookworm disease was prevalent—but where rations of meat were taken that anæmia was much less frequent. Green vegetables and whole cereals should be taken by pregnant women, as well as red meat ration. The nutritional anæmia of pregnancy was a macrocytic anæmia, not idiopathic pernicious anæmia. It was due to a deficiency in the diet of Castle's extrinsic factor, and it could be prevented or cured by adding to the diet liver or liver extracts or marmite. The result of such additions was often dramatic.

Prof. JAMES YOUNG suggested that a committee might be appointed to consider diet in pregnancy and lay down dicta for pregnant women.

Mr. VIVIAN GREEN-ARMYTAGE spoke of complications of pregnancy by such diseases as osteomalacia, beri-beri, sprue, in all of which calcium was at its lowest ebb, though unaccompanied by toxic symptoms. Though apparently healthy at birth, babies should be cared for in the first months of life on antirachitic lines. One-fertility sterility was often traceable to dietetic defects, particularly in regard to minerals.

Dr. K. J. WESTMAN said that deficiency of vitamins B and A in the food might lead to premature labour, to abortion, and to children being deficient. In six cases in which women had habitually aborted, a living child was secured by adding calf's liver to the food.

Dr. DOROTHY C. WILSON referred to lack of sunlight in the causation of osteomalacia, and instanced a region in India in which pregnant women were very liable to that disease. It had been largely reduced by making alterations in the diet.

Mr. R. H. PARAMORE considered that excess of food was a potent cause of eclampsia. One of the best methods of treating post-partum eclampsia was by bleeding. Post-partum hæmorrhage was never followed by post-partum eclampsia.

Dr. DOROTHY LOGAN asked whether the cheaper baker's yeast was as efficacious as marmite; some mothers were so poor that even 6*d*. a quart for milk was a hardship. At an institution with which she was connected a custom had been carried out since 1920 of giving three pennyworth of calcium lactate in a fresh state to antenatal cases, and the cost of that was 6*d*. a fortnight. It was a method of guarding against a calcium drain at small cost.

Sir ROBERT ARMSTRONG-JONES, alluding to the proposal to appoint a committee on the subject, said the People's League of Health already had a committee on somewhat similar lines.—The PRESIDENT spoke favourably of Prof. Young's proposal, and promised consideration of it at the next meeting of the council.

THE SILVER JUBILEE IN SOUTH AFRICA.—As Governor-General of the Union, Lord Clarendon has initiated a Jubilee fund to be devoted to the combating of tuberculosis in South Africa.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY

AT a meeting of this society, held in London on May 9th, Dr. NEIL BEATTIE read a paper entitled

Individual Psychology and Preventive Medicine

Preventive medicine, he said, had already made immense contributions to the national health by its attention to environmental hygiene. But the realisation that health meant wholeness, "the integration, unity, and harmonious working of the complete individual," gave a wider and deeper significance to the function and purpose of the health services and of medicine generally. Mechanistic medicine was concerned with the treatment of diseased organs, but the higher form of medicine—human or philosophical medicine—regarded the patient in his entirety, not as a physiological machine but as a human being with a soul. The development of the infant body depended on wise care and feeding; but the growth and development of the infant soul depended primarily on its contact with mother or nurse. The failure to establish satisfactory contact with another human being was the cause of an egocentric or subjective attitude towards life; the possessor of this life-style grew up with an unreal, unalive personality and often "needed his fellow human beings only to exploit them." The reality of life, here on earth, was in Adler's view the solving of the problems of comradeship, work, and love; and the person who was living a complete, wholesome, and healthy life was he who had successfully solved this triple task. An egocentric life-style prevented a courageous approach towards reality; and since the self-centred person was always concerned with the preservation of his own ego, stress of circumstances frequently compelled him to take refuge in psychoneurosis, psychosis, delinquency, and even actual physical illness. While the medical technician merely treated a diseased organ, the educated physician knew that, in addition to such treatment, the patient frequently required to be set free from the fear of himself—that is to lose some of his egocentricity by the development of social feeling and courage.

The real purpose of medical education was the production of an educated physician; and this could only be achieved by showing the student how to understand and know himself, setting him free from the trammels of mechanistic medicine. The greatest contribution to human medicine, said Dr. Beattie, would be made by the influence of the properly educated family physician upon diseased bodies and souls. An even greater duty was associated with the real function of the doctor in the homes of the people, as a teacher of the way of wholeness, completeness, and integration—that is, of health and freedom. The building of healthy houses was excellent and useful work, but it was the healthy *home* which produced healthy children and potentially healthy men and women. The root cause of ill-health, both physical and mental, frequently lay in disintegrated, unhappy family life; and it was for the medical profession to realise that in its hands rested much of the cure and still more of the prevention of national ills. Any medical man or woman who remained blind to the tremendous significance of the teachings of modern psychology to the science and art of medicine was in great need of the help of the very branch of medicine which he pretended to despise, and of which he was really afraid.

REVIEWS AND NOTICES OF BOOKS

Medicine and Mysticism

By R. O. MOON, M.D., F.R.C.P., Consulting Physician to the National Hospital for Diseases of the Heart. London: Longmans Green and Co. 1934. Pp. 57. 2*s.* 6*d.*

Dr. Moon in reviewing the history of medicine, sees in its progressive advance through the last century, a development of the scientific spirit, with a comparative disregard of mystical influences. The great progress that has been made, has been largely due to the use of the inductive method enunciated by Bacon and carried into practical activity by Harvey, and other leading spirits of science. The tendency on the part of mysticism, particularly its oriental expression, has been to disregard the body or, at least, to accept it merely as a vehicle for the expression of the spiritual world. Dr. Moon states that science and mysticism "would both seem to be means of revealing truth but their method of procedure is strikingly different, the two psychic tempers are alien to one another."

If, however, one reviews the history of medicine particularly during the centuries of the Renaissance—as Dr. Moon does in a most illuminating fashion—we see that medicine and mysticism have by no means been divorced from one another either in theory or in practice. The influence of Plato and of Neo-Platonism in many ways had as profound an influence on the minds of certain medical thinkers as had the teachings of Aristotle upon others. In fact there were some such as Ammonius Saccas who attempted to profit from the teachings of both schools and to colour both with oriental mysticism and with Christianity. The ultimate goal of many thinkers was the pursuit of motionlessness—i.e., of "The One," rather than of thought, which is a form of motion and activity. Mysticism in medicine must be regarded as an attempt to see the universal in the particularity of bodily phenomena, and it is only by appreciation of the fundamental spirit from which life derives that bodily function and disease can be correctly understood.

It is surprising to what extent the Pythagoreans and the Orphics have influenced the thought of Europe and permeated the systems of medicine. Dr. Moon cites the well-known doctrine of the "Critical Days" which played an important part in the writings of Hippocrates and Galen, and which seemed reminiscent of the mystical properties that Pythagoras attached to numbers. Galen, Raimond Lull, and Paracelsus, Agrippa of Netterhein, and Van Helmont were all influenced by mystical doctrines, and even Harvey himself was not entirely immune from a mystical tendency in his interpretation of organic behaviour. Hahnemann was in the line of succession of Paracelsus and his homeopathy was a dynamic conception of drugs as containing spiritual powers which were brought to life during the rubbing together of chemicals in the pharmacist's mortar.

In our own time mysticism has attempted to oust medicine from its rôle of healer of disease, in the rebirth of the doctrine of faith-healing as expressed in Christian Science. Perhaps the only true mating of mysticism and medicine has come with the development of psychopathology, a fact which the author has failed to mention. There are some who would no doubt condemn psychopathology on this account. But the discovery that many disorders of function, not only of the mind but of the body too, are occasioned by deep instinctual urges which are at one with the vital impulse itself, proves that the philosopher physicians of the Middle Ages and the Renaissance were struggling in a diffused light, which has been focused to-day upon both mental and physical disorders in such a way that the scientific approach can make use of a mental philosophy without a loss of prestige.

We commend Dr. Moon's work to the increasing number of medical men interested in the making clear these fundamental problems.

Researches on Tropical Typhus

A Study of the Bacteriology, Serology, and Epidemiology of the Disease. By LUDWIK ANIGSTEIN, M.D., Ph.D., Parasitologist to the State Institute of Hygiene, Warsaw, Poland; Lecturer in Parasitology, University of Warsaw. Kuala Lumpur: Kyle, Palmer and Co., Ltd. Pp. 184.

TYPHUS is a world-wide disease and appears invested with distinctive and peculiar characteristics in the most diverse climates and under the most diverse conditions. It would be difficult to find an investigator better qualified to study this disease in its entirety than Dr. Ludwik Anigstein. After experiencing epidemics of typhus exanthematicus during the war, he was appointed to the State Institute of Hygiene in Warsaw and there had further opportunities of observing the disease from a laboratory point of view. Since 1929 Dr. Anigstein has been investigating tropical typhus in Malaya. In an exhaustive comparative study of the puzzling natural history and serology of old world and tropical typhus he has been able to prove that the human body louse does not play any part in the transmission of tropical typhus in Malaya, although it was determined by Weigl's ingenious method of intrarectal inoculation, that the virus multiplies in the gut of the arthropod and is fatal to it. The rat *R. rattus diardi* is undoubtedly the reservoir of infection in Malaya, and examination of the smear of the affected tunica vaginalis of infected rats showed rickettsia-like micro-organisms in great numbers. The main results of this excellent piece of research support the contention of W. Fletcher and J. E. Lesslar (1925) that there are two types of typhus: the K or "scrub" type—which is the same as tsugamushi disease—and the W or urban type.

Laboratory Medicine

A Guide for Students and Practitioners. Second edition. By DANIEL NICHOLSON, M.D., M.R.C.P. Lond., Assistant Professor of Pathology, University of Manitoba. London: Henry Kimpton. 1934. Pp. 566. 30*s.*

THE author has succeeded well in his aim to provide in detail, for medical students, information on the indication, method, and interpretation of diagnostic tests that would prove most suitable when they later engage in practice. The indications for the performance of any particular investigation are clearly stated and the interpretation is explained on the basis of general principles. Actual accounts of technique are confined to those procedures which the student may himself have to use in the course of his future career as a medical practitioner. It is a particularly valuable feature of the book that clear and detailed descriptions are given of the sort of

specimen required for any particular investigation, and of the mode of collecting it. The unsuitable specimen is the bane of the laboratory worker. The medical practitioner who sent a blood smear in to his local laboratory with a request for the performance of a Widal reaction constituted an extreme example of a common type of error; others to our knowledge have expected a useful reading of the blood-sugar from an oxalated specimen, and of the blood-urea from one treated with fluoride. Readers of Dr. Nicholson's book will know better than this. It is significant of the march of clinical pathology that the author concerns himself not only with the examination of the specimen but also with its collection. Some of his hints are valuable—for example, to pass the Ryle's tube through a cocainised nostril rather than by the mouth. Clear details are given not only of the technique but also of the results to be looked for in such tests as the Schick, the Dick, and the Schultz-Charlton, which fall equally within the sphere of the clinically conscious pathologist and the pathologically minded clinician.

In the present edition fairly recent procedures such as the van Slyke urea-clearance test and the Aschheim-Zondek test for pregnancy find a place; the author describes the Friedmann modification, in which rabbits are used, to the exclusion of the original mouse method. The short section on water metabolism constitutes one of the most valuable in the book; it deals with an aspect of medical treatment too frequently neglected in this country. This section is not concerned with work at the laboratory bench; no single "test" or "reaction" is described, but everyone training for or engaged in the practice of medicine will find it profitable to ponder it.

Elementary Microtechnique

By H. ALAN PEACOCK, M.Sc., Head of the Biological Department, Cheltenham Grammar School. London: Edward Arnold and Co. 1935. Pp. 200. 5*s*. 6*d*.

THIS little book will be welcomed by many teachers of elementary biology. It sets out in a clear fashion the theories underlying microtechnique, of which more advanced students are often ignorant. The subject matter is so arranged and tabulated as to make it a useful book of reference.

The 1934 Year Book of Obstetrics and Gynæcology

Obstetrics. Edited by JOSEPH B. DELEE, A.M., M.D., Professor of Obstetrics University of Chicago Medical School. *Gynæcology*. Edited by J. P. GREENHILL, B.S., M.D., F.A.C.S., Associate Professor of Gynæcology, Loyola University Medical School, Professor of Gynæcology, Cook County Graduate School of Medicine. Chicago: The Year Books Publishers Inc.; London: H. K. Lewis and Co., Ltd. 1935. Pp. 717. 10*s*. 6*d*.

THIS small volume contains a mass of information, much of which is not to be found in standard textbooks. The original work published during the year has been summarised under appropriate headings, and the commentaries supplied by the editor are valuable and delightful. Prof. DeLee is occasionally terse and sometimes almost rude, but he gives the reader the unbiassed view and experience of one whose life has been devoted to obstetrics. What would otherwise be no more than a catalogue of recent work is converted to a stimulating review. The author's comments on the causes of maternal mortality and morbidity, and on the use of analgesic and anæsthetic drugs in midwifery will be appreciated by anyone who practises obstetrics. Gynæcology is dealt with by Prof. Greenhill in an exactly equally robust manner, and the probable success or inherent futility of any new treatment or investigation is ruthlessly assessed. The whole volume is by definition thoroughly up to date and the selection of material for inclusion is excellent.

This original and outspoken work deserves attention. For those who practise obstetrics there is practical guidance, for those who teach a commentary on their dogma, for those who learn direction for their thoughts, and for all an absorbing account of the changes that have occurred during the last three decades in the art and science of obstetrics and gynæcology.

The Problem of Mental Disorder

A Study undertaken by the Committee on Psychiatric Investigations, National Research Council. Edited by MADISON BENTLEY, Sage Professor of Psychology, Cornell University; and E. V. COWDRY, Professor of Cytology, Washington University. London: McGraw-Hill Book Company, Ltd. 1934. Pp. 388. 24*s*.

THIS book gives an excellent conspectus of the present state of psychiatric research. The outlook is optimistic but critical. The editors, with the support of the Carnegie Corporation, collected the views of the foremost workers in psychiatry in the United States. In the first section of the book current thought is presented by clinical authorities: Prof. C. Macfie Campbell and Dr. A. Myerson represent the general psychiatrists; Dr. I. S. Wechsler, Dr. Adolf Meyer, and Dr. L. S. Kubie the neurologist, the psycho-biologist, and the psycho-analyst respectively. All are temperate, all are distrustful of glib explanation. Their bias is, of course, medical; they refer always to clinical problems and look forward to therapeutic application of discovery. It is recognised throughout the work how little relevance treatment has at present to theory and to "sound and sufficient knowledge of the human organism, of its history, of its physiological and psychological operations, and of its devious and complicated career from birth to death among physical, domestic, and social hazards." Each of these contributors indicates the lines of research which he thinks fruitful.

The various sciences which must supply the assured basis of psychiatry are reviewed in the second and larger part of the book. Neural mechanisms and functions come first. Dr. Stanley Cobb deals with cerebral anatomy and physiology, Dr. George Bishop with the electrophysiology of the brain, Dr. E. Jacobson with the electrical measurement of activities in nerve and muscle, Dr. E. V. Cowdry with neurocytology, and Dr. Irvine Page with the chemistry and metabolism of the brain. After Dr. Wilder Penfield's contribution on cerebral neuropathology, and Prof. G. H. Parker's on phylogenetic aspects, Prof. C. Judson Herrick gives an exposition of the bearing of integrative studies on mental disorder. Problems of general biology and genetics are presented by Prof. H. S. Jennings, and of constitution by Dr. Walter Freeman. Dr. R. G. Hoskins considers the rôle of the glands of internal secretion. The neurocytotropic virus diseases, such as encephalitis lethargica, are the subject of a paper by Dr. E. W. Goodpasture; Dr. George R. Minot writes on nutritional problems, and Dr. K. K. Chen on pharmacology. Prof. Madison Bentley has a long,

plain-spoken, and informative chapter on general and experimental psychology relative to the problems of mental disorder, in which he sketches the lines of profitable research; it is followed by a brief paper on the psychological avenues of approach to schizophrenia by Mr. D. Shakow, and by another on the psychoneuroses from the standpoint of the clinical psychologist by Dr. Joseph Jastrow. The comparative psychopathology of infrahuman primates is set forth by Dr. R. M. Yerkes and Dr. Ada Yerkes as an aid to the study of human beings. The sociological aspects of mental illness are presented by Dr. Mandel Sherman and Dr. Irene Sherman, and Prof. A. L. Kroeber writes on cultural anthropology. A chapter on education by Dr. Leta Hollingworth ends the book, except for the comments and reflections of the editors.

The book is valuable, not as an account of what we now know, but as a reminder of the many ways in which we may hope for illumination of our present ignorance; it is also a warning against the slipshod casuistry which has at times threatened to hold the psychiatric stage.

L'âge critique

Étude Pathogénique et Clinique. By G. MARAÑON. Professeur a la Faculté de Médicine de Madrid. Paris: Libraire Félix Alcan. 1934. Pp. 333. Fr.40.

THIS, the French translation of Prof. Marañon's Spanish treatise, is a complete account of the climacteric as it occurs both in the male and female. Information dealing with this important and common period of life can only be obtained, as a rule, from a search in works on endocrinology, gynæcology, physiology, or the like; but here in one volume is the latest knowledge available. Marañon considers that the climacteric is, as a source of illness, neglected and, by the medical profession as a whole, not treated with the respect and attention that it deserves. Six chapters are allotted to the action of the ductless glands and the symptomatology is divided according to the effect on the various systems of the body. These aspects have been considered at length, and it is most disappointing to discover only 17 pages allotted to the difficult question of treatment. As Prof. Marañon has evidently acquired a complete grasp of the subject we may hope he will consider enlarging this chapter of his most interesting book to at least ten times its present size in a future edition.

Urology

Third edition. By DANIEL N. EISENDRATH, M.D., Consulting Urologist to the American Hospital, Paris; Assistant Professor of Surgery (Genito-Urinary), Rush Medical College of the University of Chicago; and HARRY C. ROLNICK, M.D., Clinical Professor of Genito-Urinary Diseases, Loyola University Medical School. London: J. B. Lippincott Company. 1934. Pp. 942. 42*s*.

THE practitioner who reads this book or even glances through it, examining the illustrations and reading the headings, will find that with a minimum of trouble he has brought his knowledge of urology up to date. In this third edition the authors have incorporated all the advances that have been made during the last few years. The most notable amongst these is the introduction of excretion urography; in their opinion it is the greatest development in urology that has taken place since von Lichtenberg and Voelcker introduced retrograde pyelography in 1906. The fact that the intravenous method is within the reach of those who are not expert in urological manipulations has established it as a routine method of examination for most lesions of the upper urinary tract. According to this book, excretion urography will supply the diagnosis alone in 30 per cent. of such cases and prove a valuable aid in at least 60 per cent. But although the technique is simple, considerable experience is required in the interpretation of results. Pyelograms of different types of pelves and calices are supplied so that the inexpert may have a working knowledge of the wide variations within normal limits.

Another advance of the last few years has been the introduction of perurethral methods of treating prostatic and bladder neck obstruction. New sections have therefore been added on transurethral electroresection of the prostate and bladder neck. Whilst recognising the place of these newer methods, the authors adopt a somewhat conservative attitude towards them. They point out that, although surgery carries with it the danger of shock to the debilitated patient, intra-urethral manipulation may sometimes produce even greater shock. Especially is this so if instrumentation has been prolonged. Resection, therefore, should be carried out as rapidly as possible and be restricted to cases that come within its scope. Another important addition to the work is in the chapter dealing with renal calculi, where new paragraphs are devoted mainly to the differential diagnosis of renal from gall-bladder shadows.

The distinguishing features of this work are clearness of expression, appropriate classification, and profuse illustration, all qualities of vital importance in a book intended for purposes of rapid revision.

Blood Groups and Blood Transfusion

By ALEXANDER S. WEINER, A.B., M.D. London: Baillière, Tindall and Cox. 1935. Pp. 220. 18*s*.

THIS book contains little that has not already appeared in the works of Schiff, Steffan and Lattes. It offers in English a competent survey of the present state of knowledge in regard to the blood groups and will be of value to those to whom for linguistic reasons the original sources are not available.

Chirurgie du pancréas

By P. BROCQ, Professeur agrégé à la Faculté de Médecine de Paris, Chirurgien des Hôpitaux; and G. MIGINIAC, Professeur à la Faculté de Médecine de Toulouse. Paris: Masson et Cie. Pp. 427. Fr.75.

DISEASES of the pancreas do not loom big in the practice of the ordinary general surgeon. Although some chronic inflammatory conditions are probably more common than they are generally recognised to be, taken as a whole affections of the pancreas amenable to surgical measures are rather rare. Prof. Brocq and Prof. Miginiac have made of this organ a special study. Dr. Brocq has already written one of the best monographs on acute pancreatitis in existence; the scale and extent of his investigations are shown by the fact that the account of acute pancreatitis in this book is based upon clinical reports of no less than 468 cases. With the same thoroughness the other diseases of the pancreas have been investigated, analysed, and presented in a form easy and interesting to read, with numerous drawings and microphotographs.

This authoritative book can be recommended to all surgeons. It brings our knowledge of the pathology, treatment, and prognosis of pancreatic diseases up to date, and is the kind of work which certainly will not lie unconsulted upon the shelf.

NEW INVENTIONS

AN IMPROVED PORTABLE ORTHOPÆDIC APPARATUS

By A. G. Ord, F.R.C.S. Edin.
HON. SURGEON, ROYAL HOSPITAL, PORTSMOUTH

Some years ago I designed a portable orthopædic apparatus for use in manipulative and operative orthopædic practice; it has, I believe, been widely employed and its usefulness been unquestioned. But it had serious disadvantages, among them being: (1) it was heavy and cumbersome; (2) there was inability to secure X ray photographs of the legs from above and below with the patient in linear extension, and inability to extend the hip-joint or flex the knee-joint; (3) the head and body supports were difficult to adjust as their shape and design did not permit either of raising or lowering the head or applying shoulder spicas; and (4) there was no provision for arm extension. These are the difficulties which I have endeavoured to overcome by redesigning the whole apparatus so that it should offer better and additional facilities.

The improved apparatus, like its forerunner, is made of aluminium, gunmetal, and steel, fits neatly into a specially constructed box measuring 37 in. by 21 in. by 11¼ in. The total weight when packed is 100 lb., of which the actual apparatus weighs 61 lb. only.

The improved apparatus is shown assembled in Fig. 1. The foot pieces (A) have been cranked out from the extension rods (B) to permit X ray photographs with the legs in linear extension; this also permits an extra adjustment allowing extension of the hip- and knee-joints, also an extra degree of abduction. The foot pieces can be rotated for eversion and inversion of the foot. Each foot piece is fitted with an improved type of foot plate (A1) and the extension screws (C) are now 18 in. long with quick travel threads. The combined pelvic support (F) and perineal guard (T) in two sizes is a new design and fixed at an increased distance from the central casting (D) to give more room for spica plasters. Overhead rods (V) are for maintaining flexion of knee when required. The pivot points of the hip-centring mechanism are now adjusted by a long crank handle (E), interchangeable for either side and also operating the moving racks (J) of the body support (G). Leg supports (S) have been remodelled and are instantly adjusted by an ingenious screw for height or distance. The body support (G) is an entirely new design. It is anatomically designed to the shape of the shoulders and is adjusted backward or forward by the crank handle (E) for different trunk lengths. The two small wheels (H) on its upright supports and the moving racks (J) make this adjustment rapid and easy when the patient is in position. Its greatest use is for the application of plaster spicas as the support can be quickly withdrawn after bandaging. The head support (K) is also a new design. It is saucer-shaped to conform to the contour of the head, provides complete immobilisation, and can be raised and lowered at will by adjustment of a swivel screw. Independently supported, it gives increased stability.

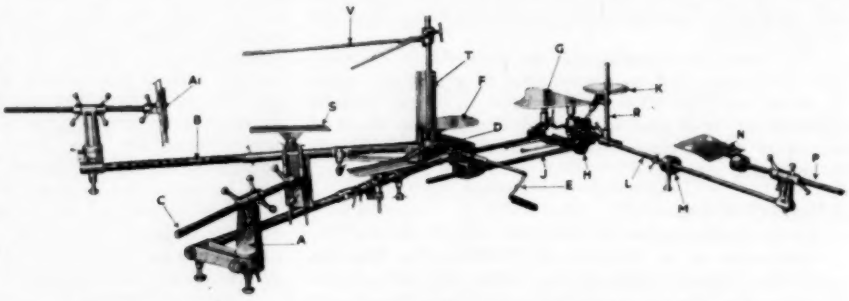

FIG. 1.—Shows the complete apparatus assembled, fitted with the arm extension.

The arm extension (L) is an entirely new fitting, and can be used for either arm. The ball-and-socket movement (M) allows flexion of the arm. The hand plate (N), fitted with slots for bandaging, is also provided with ball and socket for dorsiflexion or volarflexion. An extension screw (P) gives extension in conjunction with an upright adjustable rod (R) for counter extension. I have found the arm extension invaluable for high fractures of the surgical neck of the humerus, the head of which is fixed with an awl, the arm extended and subsequently abducted. This manœuvre reduces the fracture which is at once fixed by a spica or other method. The ball-and-socket movement on the hand plate provides internal and external rotation of the humerus and pronation and supination of the elbow. Radial and ulnar flexion of the wrist-joint is also possible. Fig. 2 shows a patient in position on the apparatus with the limbs in abduction, right leg in extension and left leg externally rotated to give additional extension of the hip. Special spats it will be seen are used for extension. I have found these leather extension spats to be an immense improvement on bandaging the feet to footplates.

A special canvas stretcher has been devised which can be used with carrying poles if desired. The hooks and eyes of the original model have now been replaced with a modern type of zip fastener. After the patient has been placed on the stretcher the zip fastener can be opened, when the flaps can be completely opened back.

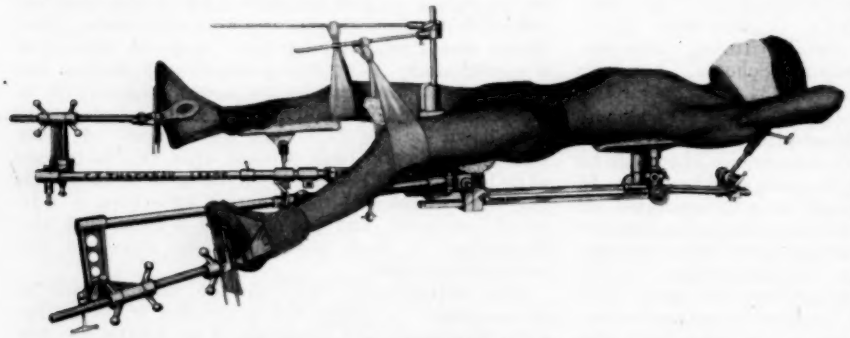

FIG. 2.—Shows a patient in position on the apparatus, with limbs in abduction, right leg in extension, and left leg externally rotated to give additional extension of the hip. Note special spats used for extension.

The improved apparatus has been made by Messrs. Chas. F. Thackray, Leeds, to whom I am much indebted for the able manner in which they have carried out my suggestions.

THE LANCET

LONDON: SATURDAY, MAY 25, 1935

RESEARCH IN PSYCHIATRY

THE study of mental disorder is just emerging from an unhappy phase of its development. Much neglected and over-simplified, it had become a centre of polemics about method and interpretation before its problems were defined. Available facts were ignored, and available methods contemned; partisan feeling stood in the way of fruitful research; argument took the place of demonstration, and the plausibility of a hypothesis was more important than its verification. The causes of all this are not altogether obscure. Psychiatry embraces conditions ranging from gross madness to inconspicuous peculiarities of disposition, and it is not easy for any one man to become familiar with the whole of this range of material. In England, indeed, it was almost impossible in the early years of this century until HENRY MAUDSLEY'S plan was made actual after the war. There was no psychiatric clinic providing the means for acquiring such familiarity—no acknowledged centre of research and clinical experience which should be normative and materially disinterested. The problems of psychiatric research, moreover, proved to be not only complex but in some ways alien to medical modes of thought. Scientific methods profitably applied elsewhere in medicine seemed in the main sterile here beyond a certain point, while newer scientific methods appropriate to this study were not brought into touch with living clinical psychiatry. For one novel mode of approach, the psycho-analytical, undue claims were made. A study, such as that of psychiatry, which seemed to be vague, contentious, and scientifically stagnant, did not draw many workers trained for research. Many psychiatrists thought of the subject in terms of a false antithesis; description or investigation, custody or treatment, understanding or diagnosis, psychiatry or medical psychology: these were the spurious watchwords which darkened counsel. Groups of physicians espoused causes to an extent obsolete in other branches of medicine. It was asserted on the one hand that the only fruitful line of investigation was that which could be carried on in the consulting-room and was indistinguishable from treatment; others were equally confident that only in the laboratory, and without any use of the clinical worker's body of knowledge, could advance be looked for.

In medical practice many of these views and turmoils still persist. But in research that phase is almost done with; there is now more activity and less casuistry, more suitable choice of methods, and not so much of the "get rich quick" attitude. Attempts are being made along many convergent lines to clear up the obscurity about these illnesses, these disturbances of harmony within the organism as well as between it and its environment. So a survey, reviewed elsewhere in this issue, of the outlook for research in psychiatry, which is sponsored by the Carnegie Corporation and the National Research Council in the United States, is timely. The editors have enlisted a most distinguished group of psychiatrists and other investigators to examine the prospects for research. Those among the contributors who are in touch with the clinical material are of like mind with Sir THOMAS LEWIS in their insistence that the research must start from the actual problems of disease and must return thereto, though the methods be borrowed from other sciences. Research in psychiatry by those who know nothing of psychiatry is apt to be fruitless because irrelevant. Here questions of organisation and more particularly of training arise; even the representative of the psycho-analysts in the symposium considers that the most serious handicap to the progress of knowledge lies in the "totally inadequate training" which many psycho-analysts have had in the associated fields of neurology and psychiatry, as well as in their own special discipline. The supporting sciences must be the means of fresh advance and the guarantee of its stability. Some of them deal with minute observations, others with the coördination of large bodies of fact. The former are the more precise, the latter the more significant, but the division is not sharp; all find their place in the framework. There is the physiology of neural mechanisms and functions, which may be concerned with electrical, chemical, structural, integrative, or embryological aspects of this complicated apparatus. There is the biological study of heredity and constitution, now continually freshened by discoveries in the non-human field. Special methods of investigation have been developed in pharmacology, in work upon nutrition, upon viruses, and upon the endocrine system, which can be applied here. Psychology, formerly remote and sterile, is no longer an armchair pursuit or arid scheme, but a well-based, manifold, growing branch of experimental science, averse from loose speculation and distrustful of the haze that sometimes passes for "medical psychology." It is itself relevant to psychiatry and contributory to further knowledge; psycho-analysis is only one of its branches, and an uncertain one. From the behaviour of infra-human primates, moreover, as from the data of cultural anthropology, psychopathology is likely to be fructified. Man must be studied in his social setting by psychiatrists, for maladaptation is the very touchstone of mental disorder. Sociology, therefore, and education are invoked for their contributions, enormously valuable so long as statistical and other controls are rigorously brought to bear on them.

These are not merely hopeful fantasies, but records of present activity. The results are still few because the problems are unusual and difficult. That such results as have been established can only

to a limited extent be translated, as yet, into treatment and prevention, is not astonishing. Psychiatry, as one of the most complex problems in biology, cannot hope to be exempt from the patient labour that must precede before even a limited mastery over complicated forces is attained.

INSURANCE CLAIMS AND ACCIDENT CASES

THE facts that are coming to light about the economic aspect of the treatment of patients who are the victims of accidents have a deep significance for the community. Orthopædic surgeons have for years been urging the importance to patients and employers of efficient treatment in the avoidance of permanent disability; their success has been marred, partly by inefficient organisation in most hospital centres, and partly by lack of financial support. It seems that it must now be only a matter of time before the insurance companies awake to the fact that they are paying out in compensation for time off work and for permanent disability sums out of all proportion to the amounts they would expend in directly financing, in part at least, the treatment of their clients by efficient methods. The State of New Jersey, U.S.A., has found this out and, as we have noted in a recent article (THE LANCET, April 6th, p. 817), taken appropriate action. The same lesson is to be learnt from the report of the working of the Accident Hospital in Vienna, for the building, equipment, and running of which the national insurance companies are responsible. LORENZ BÖHLER in the fourth edition[1] of his "Treatment of Fractures," now available in an English translation, deals in an addendum with the economic aspect of fracture treatment.

All those whose work has to do with accident insurance would do well to read Prof. BÖHLER'S book and learn such facts as this. In the year 1929 the maintenance cost of the hospital was 396,000 Austrian schillings. The saving on total compensation paid to 124 cases of fractures of the long bones treated in the hospital during that particular year, as compared with the compensation that would have been paid to the same cases in 1911, was reckoned at 370,972 *sch.* The figures tell the story plainly, especially when it is pointed out that, as well as these 124 fracture cases, 6000 other patients were treated in the hospital for the total maintenance of 396,000 *sch.* Two types of accident particularly interest insurance companies in general—viz., industrial accidents coming under the Workmen's Compensation Act, and third-party accidents on the road. It is the problem of the injured workman that has been the particular concern of the Austrian insurance companies. An impoverished country could afford neither the economic waste of having thousands of its workpeople attending physical therapy clinics for months or years when they might be usefully employed, nor the vast sums expended annually in compensation. In our country insurance against road accidents has added to the already very great financial interest of insurance companies in the correct treatment of accident cases. If, as seems possible, the cost of repairing injury to the person as well as to the vehicle in every accident is eventually covered by insurance, the problem will loom even larger. As it stands now, the hospital bill in certain claims only is met by insurance, while more often than not the surgeon's work is done for nothing. As Prof. HEY GROVES puts it,[2] "the car is paid for, but the patient's bones have to be mended as a matter of charity."

There are three types of personal injury in which skilled attention, from the first reception of the case at an accident clinic to its final discharge, are of great importance. These are fractures, especially of the long bones and of the spine, tendon lesions, and injuries of the hands. Prof. BÖHLER quotes figures which emphasise the economic importance of the last-named. In 1911 the Workers Accident Insurance Company in Vienna paid in compensation for fractures of the long bones 2,875,418 *sch.*, and for 2905 injuries of the fingers 3,859,466 *sch.* Every open wound of the hand, and every injury to the tendons, is a potential cause of crippling, and in any worker using his hand for skilled labour a potential claim lies for permanent loss of work. Yet the casualty department of a hospital, in charge of an officer without mature experience and not necessarily with any special skill in accident work, is usually considered a suitable place for the treatment of these cases. This is the accepted procedure in this country; BÖHLER'S plan is for the doctor who first deals with the case to be responsible for the treatment throughout, and even to write the final report, thus verifying the success (or otherwise) of his treatment. This seems reasonable, but it necessitates the placing of accident clinics in charge of paid officers who are skilled at the work, and some of whom at least must be on a full-time basis. The money needed to organise such clinics is at present being wasted on unnecessarily prolonged treatment, and in large sums for permanent disability. The victim of a Colles's fracture of the wrist, for example, can be back at work in about one quarter of the time if efficiently treated throughout and, according to figures quoted by HEY GROVES, the average percentage of permanent disability can be reduced from 23·6 to 0·4. It has been objected to the organisation of such clinics that pressure could not be put on insured persons to use them. No compulsion is exercised in the Viennese hospital and yet the scheme has been a success. Workmen insured by the company have the right of treatment at the hospital, but they are not forced to attend there. The building and equipment of the hospital, including the provision of X ray plant and other apparatus, cost £10,200. If the insurance companies concerned in the payment of accident claims were convinced that the cash saving for time off work, for prolonged treatment, and for permanent disablement was as material as in fact it would appear to be, the proper organisation of accident treatment would soon be put on a sound basis in this country.

[1] Reviewed in THE LANCET, April 27th, p. 992.

[2] Brit. Med. Jour., April 20th, p. 813.

MALARIA AND RACIAL EXTINCTION

FROM time to time historians have invoked the spread of malaria to explain the decline of human populations. Usually the changes in question have taken place so long ago that this hypothesis is not susceptible of proof. But on another page of this issue will be found a remarkable paper by Dr. A. J. COPELAND which contains evidence that within the last few years certain of the peoples in North Borneo have begun to fall victims to this fate. There are two native races in North Borneo, each numbering rather less than 30,000: the Dusuns, an agricultural, rice-growing people, inhabiting the more open higher lands; and the Muruts, who inhabit the jungles at lower levels and live mainly by hunting. Whereas the Dusuns are on the whole a thriving race whose numbers are on the increase, the Murut population has been falling steadily during the past eight years, and Dr. J. G. CAMPBELL is quoted as stating that "unless given systematic and energetic medical aid" this race is "doomed to slow but inevitable extinction." The decline of the Muruts is ascribed by COPELAND to malaria. The village headmen state that there have been more cases of fever in recent years; there have undoubtedly been extensive clearances of jungle; and the imported Javanese labourers are believed to have brought with them strains of malaria parasite, particularly subtertian strains, to which the Muruts are not accustomed.

A prima-facie case is made out in favour of this view. It is regrettably true that after all these years new land in the tropics is still recklessly opened up by planters or engineers without consulting the malariologists; and thereby their employees and the local population are often needlessly exposed to malaria. There are, however, some missing links in Dr. COPELAND'S chain of evidence which must be filled in before his theory can be regarded as fully proved. The official vital statistics which he quotes, showing death-rates as low as 14 or 15 per 1000, can hardly be taken as accurate. And then it is generally believed, though the relevant facts are extraordinarily hard to obtain, that hyperendemic malaria reduces the population by causing heavy infantile mortality; whereas COPELAND seems to attribute the reduction in the numbers of children chiefly to a lower birth-rate. Nor is there any evidence, though it is certainly likely, that recent clearances have in fact favoured the dangerous species of anophelines. The decrease in native populations is often due to subtle influences of an imponderable psychological character. Some races seem unable to thrive in contact with advancing civilisation; and this inability is apt to be more pronounced in a hunting than in an agricultural people. Such a failure of adaptation is the most probable cause of the decline, for example, of the Sakais of Malaya.

Dr. COPELAND'S thesis is nevertheless suggestive, and clearly demands examination. His paper gives a vivid picture of how medical work is carried on by a sympathetic medical officer among primitive peoples, and it incidentally illustrates once more the propagandist value of yaws treatment in popularising western medicine. To improve the malaria situation he encountered he proposes the wholesale distribution of quinine, and certainly the present issue is hopelessly inadequate; but it would be unduly optimistic to expect native villagers to take enough quinine to eradicate the disease. However popular the remedy, quinine treatment would have to be associated with a study of the mode of life of the Muruts, with a view to inculcating habits of clearing, housing, and living which will do something to preserve them from malarial infection. And it is to be hoped that Dr. COPELAND'S observations will stimulate the Government of North Borneo to undertake work along these lines.

ANNOTATIONS

INSTITUTE FOR MEDICAL RESEARCH, OXFORD UNIVERSITY

THE statute establishing an Institute for Medical Research at Oxford, recently approved by Congregation, represents the latest development of a scheme which had its origin about five years ago. At that time Lord Nuffield—then Sir William Morris—bought the whole of the Observatory grounds and buildings from the Radcliffe Trustees for the sum of £100,000 and handed them over to a body of trustees, called the Morris Trustees, for the joint benefit of the Radcliffe Infirmary and the university medical school. It was indicated in the trust deed that the greater part of the land was to be used for the needs of the infirmary and for such extension of that institution as from time to time might become necessary. On the other hand, the Observatory buildings, the Observer's house, and a considerable area of surrounding land was assigned to the university for the purpose of promoting clinical research. The trustees also had in mind the possibility in the future of a ward, devoted to clinical research, which could be brought under the general administration of the infirmary in regard to its upkeep and nursing, with the proviso that it should not become an additional expense nor a source of profit to the institution. In order that the university should take advantage of the opportunity and accommodation provided by Lord Nuffield's great generosity, a scheme for the establishment of a Medical Research Institute was drawn up by the board of the faculty of medicine. The university has shown its desire and willingness to assist the scheme officially by providing the sum of £1000 per annum until such time as the institute is sufficiently endowed to run on its own resources. The board of the faculty of medicine have agreed that a recent bequest amounting to £30,000, generously made to the university by the late Mrs. Theodore Williams, should be used for endowment, and there are smaller sums available from other sources. Lord Nuffield has shown his interest and further generosity by offering to help towards the expense of altering and equipping the Observatory building for its new purposes.

The Observatory buildings become vacant in June and it is intended to use them for two lines of research—namely, therapeutics and X ray cine-

matography. There has been little organised research in therapeutics in this country and no place where drugs used in medical practice can be subjected to independent and searching tests by pharmacological as well as clinical methods. It is hoped that Prof. J. A. Gunn, as director of the institute, with the facilities afforded by his pharmacological department and with the ready coöperation of the medical staff of the infirmary, will be able to fill many gaps in our knowledge of the action of drugs and to open new lines of advance in their clinical application. At first sight the connexion of X ray cinematography with therapeutics may not be obvious, but the former is a new scientific instrument which promises to throw light not only on clinical but on anatomical, physiological, and pharmacological problems. The recent developments of this technique by Dr. Russell Reynolds in London, and by Dr. R. Janker of Bonn in Germany, are indicative of its future value both in research and in teaching, and further progress may be expected from their exploitation in connexion with the sciences ancillary to medicine.

It may be justifiably hoped that the establishment of a medical research institute at Oxford, even though it begins in a modest way, will help to meet the generally admitted need for such units in this country. There are always a certain number of medical men and women who are drawn towards research in preference to practice, who spend some years in training for research, and who are obliged to desert it because there are open to them so few posts which give them the necessary facilities as well as an adequate stipend. There is every possibility, too, that this unit may encourage closer coöperation and more combined effort in attacking problems which are of common interest to the staffs of more than one scientific department in the university.

THE EFFECTS OF HOT CLIMATE

IN a paper read to the Royal Society of Tropical Medicine and Hygiene last week Dr. D. H. K. Lee drew attention to the urgency of problems connected with the settlement of tropical countries by peoples unaccustomed to the climate. The physiological effects of the heat itself although of great importance were, he thought, imperfectly understood. Some idea of the causes of breakdown could however be gained by combining our knowledge of the physiology of temperature regulation with the signs and symptoms of certain non-infective tropical disorders and the particular circumstances accompanying their onset. In recalling the ways in which the body keeps its temperature constant, he mentioned one or two points which are frequently overlooked. The body can increase its heat loss by dilatation of the skin vessels, allowing greater opportunity for radiation and conduction, and by activation of the sweat glands, causing cooling by evaporation. Dilatation of the skin vessels means an increase in the systemic vascular bed, and is accompanied by an actual increase in the blood volume which draws on the water stores of the tissues. Effective perspiration, which is the more important cooler, also depends on a sufficient reserve of water. There is thus a definite link between dehydration and temperature control. The complementary method of keeping down temperature by reducing the amount of heat produced is effected not only by an involuntary decrease in muscle tone or voluntary abstention from muscular exercise, but also by a diminution of the activity of the thyroid, suprarenals, and sympathetic nervous system, whereby the basal metabolic rate is reduced. Less food is then required and artificial stimulation of appetite becomes inadvisable.

Physiological adaptation to the effects of heat may, according to Dr. Lee, break down at four points.

(1) *Hyperpyrexia.*—A certain raising of the temperature on exposure to heat is not unphysiological so long as there is time for the readjustment of equilibrium to meet the new conditions. A progressive unchecked rise is a sign of failure of adaptation, and the result depends upon whether artificial lowering of the temperature can be achieved before some vital tissue becomes damaged. Neuroglobulin is precipitated at 108° F.; something less than this may be regarded as the critical temperature. There are naturally many predisposing causes of hyperpyrexia, but inhibition of sweating would be by far the most powerful, and is in fact met with in many cases of "heat stroke." The symptoms are well known.

(2) *Circulatory failure* is encouraged by heavy meals, alcoholic indulgence, continued standing, and emotional disturbance—in fact, by anything requiring a considerable redistribution of blood in the already enlarged and adjusted vascular bed. The symptoms include fainting, nausea, dyspnœa, and exhaustion, and may be grouped as "heat prostration."

(3) *Electrolyte imbalance* (to whose importance Lieut.-Col. O. R. McEwen has recently called our attention) is seen chiefly as chloride loss, due to excessive sweating and the replacement of fluid by pure water. Symptoms occur when the serum chloride falls below 100 mg. per litre; they consist of painful muscle cramps often preceded by a day or two of general malaise. The treatment is the administration, intravenously if necessary, of sodium chloride, and prophylactically the daily output of this salt should not be allowed to fall below 3 grammes.

(4) *Super-dehydration* can only occur where water is unobtainable, and its effects are many. First the symptoms of circulatory insufficiency may appear, but are replaced by the more serious effects of direct deprivation of water in the various organs, and are often complicated by a rise of temperature.

Under each of these headings Dr. Lee presented a table correlating physiological effects with clinical manifestations; in each case the essential features of the syndrome are accompanied in lesser degree by one or more features of the other types of disorder. He has undoubtedly cleared the air by deriving certain principles from a mass of confusing and incomplete data, and his analysis should lend direction and impetus to the study of heat adaptation.

PSITTACOSIS

DESPITE an embargo on the import of parrots occasional cases of psittacosis have been occurring in this country ever since the subsidence of the 1929–30 epidemic. And the same thing has been happening elsewhere. In Germany, for instance, Fortner and Pfaffenberg[1] have reported nearly 150 cases during the first half of 1934—an incidence little different from that of 1930. Almost without exception these cases have arisen as the result of contact with budgerigars (love-birds), and although it is known from the work done in 1930 that the budgerigar can suffer from psittacosis and infect man, the disquieting thing about these recent outbreaks is that the birds responsible have seemed to be in good health. That an apparently healthy parrot, a carrier of the virus, can give rise to human infection was shown by the investigations of Bedson, Western, and Levy Simpson[2]; and it is also known that carriers of psittacosis virus occur amongst home-bred budgerigars (Gordon[3]). In a paper published in our present issue, Dr. Levinthal produces

[1] Fortner, J., and Pfaffenberg, R.: Med. Klinik, 1934, xxx., 787; Zeits. f. Hyg. u. Infektionskr. 1934, cxvi., 397.
[2] Bedson, S. P., Western, G. T., and Simpson, S. L.: THE LANCET, 1930, i., 345.
[3] Gordon, M. H.: Ibid., 1930, i., 1174.

further evidence that man can be infected by apparently healthy budgerigars (virus-carriers) and that a proportion of home-grown stocks of these birds is infected. As he points out, the budgerigar is probably less susceptible to the virus of psittacosis than other species of the parrot family and when naturally infected tends to become a carrier rather than a frank case of the disease. He also suggests that during the 1929–30 epidemic, when infected parrots were broadcast throughout the country, many of the stocks of home-bred birds became contaminated and that the infection persists to-day. Whether this view is correct or not—and there is much to be said in its support—the fact remains that the home-bred stocks are infected and that cases of human psittacosis are occurring, though fortunately there are very few of them.

Not only should the public be aware of the danger but the medical profession should be on the look-out for cases. Without going into the differential diagnosis, it may be said that psittacosis should be suspected wherever there is an acute febrile illness in a person who has to do with budgerigars, especially if it presents the picture of a toxic pneumonia. In endeavouring to reach a correct diagnosis the laboratory can help,* and though the virus is present in the blood stream during the early days of the disease and can be demonstrated there by mouse inoculation, the sputum is the material of choice. Virus is quite constantly present in the sputum and its presence there can be established by mouse inoculation. Unfortunately sputum is not always readily obtainable for its scantiness is a feature of the disease, but usually with a little patience a satisfactory sample can be procured. Failing the demonstration of virus in material from the patient, specific antibodies may be sought in the blood, making use of the complement-fixation test elaborated by Bedson.[4] In this connexion it must be pointed out that specific antibody is not always developed and never in large amount; and of course this complement-fixation test, like any other serological reaction, has not the same value as isolation of the causal agent. Another line of investigation which may provide valuable evidence is the attempt to demonstrate psittacosis virus in the birds with which the patient has been in contact. This should be done even though they seem to be in good health; but it should not be forgotten that the finding of psittacosis virus is nothing more than circumstantial evidence that the human case is due to the same agent.

Concerning the virus itself, Dr. Levinthal's paper does not perhaps carry us much further. He holds that he has established definitely that this virus is the true causal agent of psittacosis because he has grown it outside the body in tissue culture and produced the disease with culture virus. The observations are interesting, but it is arguable on the other hand that virus grown in cells in vitro is no more a pure culture than virus grown in the cells of a living animal (such as the mouse) which does not suffer spontaneously from psittacosis. Hence there is room for difference of opinion over the claim that he is the first to show that this virus fulfils the postulates of Koch. He also differs from Bedson and Bland,[5] and Bland and Canti [6] in interpreting the relationship which the different virus forms bear to one another, taking the view that the elementary bodies are capable of multiplication without necessarily passing through large and intermediate forms. Whether or not he is right it is impossible to say from the evidence at present before us.

* Material may be sent to Prof. S. P. Bedson, F.R.S., at the London Hospital, E.1, or to Dr. Levinthal at the National Institute for Medical Research, Hampstead, N.W.3.

[4] Bedson, S. P.: Brit. Jour. Exp. Path., 1933, xiv., 162.

[5] Bedson, S. P., and Bland, J. O. W.: Ibid., 1932, xiii., 461; 1934, xv., 243.

[6] Bland, J. O. W., and Canti, R. G.: Jour. Path. and Bact., 1935, xl., 231.

BRITISH SOCIAL HYGIENE COUNCIL

A LETTER published in THE LANCET of March 23rd last from Lord Horder and a representative group of co-signatories sets out the urgent need of the British Social Hygiene Council for further pecuniary support on arrival at its twenty-first birthday. A frank statement at the last annual general meeting of the Council concerning its financial position, no less than Lord Horder's letter, has paved the way for a special appeal for money. The voluntary sources of the Council raised from previous appeals are exhausted, and the funds show a considerable annual deficit. Considering the great objects before the Council and the success which can be attributed to its work in many directions, it is sad to contemplate that its efforts may be compelled to cease through lack of pecuniary support. Lord Stanley of Alderley has come out as chairman of an appeal committee, stating that this is the first organised appeal made by the Council and that £100,000 are needed. The forcible argument in his appeal is that the present generation is paying for the ignorance of its parents, and that since 1914 the Council has striven, in behalf of the present and future generations, to mitigate the tragedies among us, to root out their causes where possible, and to exterminate the evil influences perpetuating them. Lord Stanley of Alderley writes: "Since 1914 the British Social Hygiene Council has helped to reduce such cases by 57 per cent., principally by preventive education to the parents of the future generations, and it can continue this work until Britain is cleansed of the scourge—if you will help." The replies to the appeal should be made to Lord Stanley of Alderley, Appeal Committee B.S.H.C., 17, Dartmouth-street, London, S.W.1.

With the letter of appeal a brochure is enclosed entitled "Safeguard the Youth of the Nation and protect the Next Generation." It is a graphic summary more particularly of the work already done by the Council as an outcome of the report of the Royal Commission on Venereal Diseases. It is pointed out that the social hygiene activities of the Council, by stirring up the public health conscience, should lead to the reduction not only of venereal disease, but of many other scourges. That active health policy needs an understanding of human biology is a plea for support of the Council that none can gainsay, and as a campaign in this direction the proceedings at the Seventh Imperial Social Hygiene Congress to be held on July 8th to 12th, 1935, should be of great practical value. The congress is under the direct patronage of the Minister of Health and the Secretaries of State for India and for Dominion Affairs, as well as of the President of the Board of Education and many high Commissioners from the dependencies. The subjects to be introduced by inaugural addresses or discussed in conference are the relations of the teachings of sex behaviour to religious ethics, modern experiments in the field of social hygiene, biology in relation to social welfare, and juvenile delinquency. Immediate social problems within the Empire form the theme of one of the sessions, while in others the latest advances in the treatment of venereal diseases and the problems met with in the teaching of biology will come up for consideration. Membership tickets for the Congress are issued at £1 each, and should be applied for

at Carteret House, Westminster, the offices of the Council.

A summer school will be opened at Westminster College, Cambridge, from Tuesday, July 30th, to Tuesday, August 6th, the inspiration here being the following words in Sir George Newman's report for 1933, as chief medical officer of the Board of Education. Speaking of emotional training and sex education Sir George said: "It seems reasonable that, at the present day, some appropriate instruction and guidance should be provided before children leave school, either as part of elementary biology or hygiene or otherwise." The Council is endeavouring to carry out the ideas embodied in that sentence, and at the summer school at Cambridge, Sir Walter Langdon-Brown, regius professor of physic in the University, and Mr. Z. F. Willis, assistant general secretary, National Council of Young Men's Christian Associations, will be among the prominent supporters. Courses of lectures include a series by Dr. L. J. Bendit, assistant physician, Institute of Medical Psychology, by Dr. Grace Calver, physician to the children's department of that institute, and Mr. P. F. Lee, B.Sc., education officer, B.S.H.C. The fee for membership of the summer school is £1 1*s*., and the boarding fee from tea-time on July 30th to lunch on August 6th is £3 10*s*. inclusive, or 12*s*. 6*d*. per diem for those who stay for shorter periods. All communications should be addressed to Carteret House, S.W.1.

MEASUREMENT OF ALLERGY IN TUBERCULOSIS

ALMOST 45 years ago Robert Koch observed that tubercle bacilli injected into a healthy guinea-pig produced results very different from those obtained when the bacilli are injected into a tuberculous animal. He followed this up by further experiments which showed that dead tubercle bacilli or bacillary products (which he afterwards termed tuberculin) acted in the same manner as the living bacilli. He did not give a name to this phenomenon, but seven years later Clemens v. Pirquet, following his classical study of vaccinia, called it "allergy." All the years which have elapsed since Pirquet suggested that the reaction was allergic have not been sufficient to exhaust the discussion which has arisen as to the significance of the reaction to tuberculin in the diagnosis of tuberculosis. Even to-day, while it is agreed that a reaction is evidence of sensitivity to tuberculous infection, there is no agreement as to the quantitative value of the test, nor as to whether it may be taken as an index of immunity. Thus we have been driven to assume that there is what may be called a "general population" reaction, but are left in the dark about whether there is a definite relationship between the presence and intensity of the reaction and the clinical process. Rich, Jennings, Rothschild, and others [1] have shown that desensitisation may be produced without interfering with immunity. In a lecture delivered in March, 1934, at the Lister Institute of Preventive Medicine, and later elaborated in four papers [2] by himself and Dr. A. V. Chwalibogowski, Dr. Fr. v. Gröer, professor of pædiatrics in the University of Lemberg (Poland), has taken up the task of coördinating the facts about allergy. He regards allergy as a dynamic concept determined by two variable factors: susceptibility (S) and reactivity (R), which are in complex relationship to one another. The allergic process can be represented as a function of the factors S and R.

Applying the intradermal tuberculin test in falling decimal dilutions, and measuring in millimetres the diameters of the resulting skin reactions, he found it possible to differentiate three distinct groups of cases, according to the behaviour of the skin response as the concentration of tuberculin fell. In Group I. the diameters (D) were inversely proportional to the negative index of the concentration, so that the product ($D \times -\log C$) remained practically constant (homodynamic allergy, interpreted as signifying an exact balance between reactivity and susceptibility, $S = R$). In Group II. the diameters do not decrease proportionally with the concentrations, so that the product ($D \times -\log C$) progressively increases (heterodynamic allergy of "pleoæsthetic" type, $S > R$); while in Group III. the diameters fall rather precipitately as the concentrations fall, so that the product ($D \times -\log C$) progressively falls (heterodynamic allergy of "pleoergic" type, $R > S$). Methods are given for obtaining values of R and S from the allergy curves.

Correlation of the clinical groupings with these numerical data, oft repeated throughout long periods of observation, led to the following findings. Clinical Group I. (tuberculin-positive, no specific symptoms) belonged without exception to the pleoergic type. Clinical Group II. (suspects without definite symptoms, or cases which have recently shown some signs of active tuberculosis but actually free) exhibited the homodynamic, while Clinical Group III. (manifest tuberculosis with tendency to amelioration and recovery) and Clinical Group IV. (clinically bad prognosis) exhibited the pleoæsthetic type of allergy. These two latter groups could be distinguished only by repeated estimations of R and S, which indicated in the one case a transition from the pleoæsthetic to the homodynamic or pleoergic, and in the other a still further progress towards the pleoæsthetic state of allergy.

The conspicuous advantage of Prof. Fr. v. Gröer's formula lies in the fact that it reduces two variables to one numerical product, thus avoiding the mental correlation of dose with reaction. Unfortunately, so far as his experiments show, these results are only reliable in children, although he is engaged on work which he hopes may lead to an equally exact system of measuring sensitivity in relation to clinical activity for adults. The theory has been worked out in 100 children, and Gröer remarks: "The full significance of the method would be apparent on following up the alteration of the allergic condition over a period of clinical observation. It is not the statics, but the dynamics of allergy that is of prognostic value." He admits the necessity for assessing sensitivity in conjunction with clinical observation, particularly in relation to the blood picture and the sedimentation-rate of the erythrocytes. While claiming that his is the only system which will furnish this "measure" of clinical condition or its absence, he recalls the attempt of Ellerman and Erlandsen in 1909 to solve the same difficulties. Gröer's quantitative methods and their bearing on diagnosis and prognosis deserve, in our opinion, the careful consideration not only of tuberculosis specialists but also of all engaged in the study of allergic disease.

RADIOGRAPHY UPSIDE DOWN

CHANGES in the radiographic appearance of the lung when the patient is (so to speak) standing on his head are reported by C. Malpelli,[1] who thinks inversion of value in the diagnosis of pulmonary lesions. In the usual upright position, the lung tissue is distended by its own weight and this distension is greatest at the apex. In the inverted position, the relative opacity of the apex and base of the lung is altered, the former becoming more and the latter less opaque; at the same time the general distension of the organ is reduced, since its weight

[1] Bull. Johns Hopkins Hosp., 1933, liii., 172, and 1934, lv., 232.
[2] Zeits. f. Kinderheilk., 1934, lvi., 379, 390, 631, 669.

[1] Atti e mem. della Soc. Lombarda di Med., 1935, iii., 229.

exerts traction chiefly on the diaphragm, which is elastic and deformable, instead of on the relatively rigid chest wall. Malpelli discusses the information obtainable chiefly in relation to the presence, extent, and stage ef tuberculous lesions. A small exudative focus which escapes recognition in films taken in the normal position may, he holds, be revealed by inversion, the reason being that factors which make for increased opacity at the inverted apex are especially active in the diseased area. When collapse therapy is under consideration and the discovery of any disease in the contralateral lung is important, the method is said to be definitely helpful. An obvious objection is that the patient is obliged to be in an uncomfortable position when the pictures are taken, and it is doubtful if this would be practicable in any but the mildest cases.

TREATMENT OF INGROWING TOENAIL

INGROWING toenail is one of those minor lesions that may lead to much trouble. After radical treatment by removal of nail and nail-bed the process of recovery may necessitate months off work, and involve no little discomfort. Among the causes H. S. Dolan [1] refers to trimming of the nails so that the corners are cut away; wearing of shoes that crowd the toes together; infection of the tissue adjacent to the side of the nail, which is already subjected to pressure and is unprotected where the nail has been pared; and (occasionally) trauma to the nail-bed, leading to deformity of the nail and its irregular growth. In the milder cases a cure may be wrought by getting the patient to wear the right shoes and cut the nails properly, steps being taken at the same time to harden and disinfect the granulating surface. For this last purpose Dolan advises that a small pad of absorbent cotton-wool soaked in tinct. ferri perchlor. should be worked in with a fine instrument beside the lateral margin of the nail, the process being repeated in two days' time. Where the infection is more severe, and the granulation tissue is heaped up over the margin of the nail, more drastic treatment is called for. Except in cases showing gross deformity and much pressure of the nail edges into the soft parts, Dolan does not advise complete eradication of the nail and nail-bed, preferring partial lateral removal of the nail and underlying bed, with removal of the granulation tissue at its edges. He operates with a tourniquet applied to the toe, and carries the incision downwards almost to the interphalangeal joint capsule of the distal joint. The healthy tissue outside the granulating area is undercut sufficiently to form a flap, and this is used to cover the raw surface left after excision of the strip of nail and nail-bed. Where complete removal of nail and nail-bed is required Dolan has been concerned to find a means of hastening the healing process, both because of the inconvenience and loss of time it involves, and because the slowly granulating surface is unpleasantly liable to infection, with a risk of osteomyelitis of the terminal phalanx. He does not altogether approve of the partial removal of the terminal phalanx, which was designed to allow the fleshy pad at the end of the toe to be sutured over the raw area. The disadvantages are that the end of the toe is left tender, and the toe is shortened. Dolan's plan is to do a more complete operation, dissecting up a flap over the base of the nail to ensure complete removal of all nail tissues; he then implants into the raw area a series of "pinch" skin-grafts, placed close together and lying on the periosteum. A layer of dry gauze holds the grafts in place, and outside this the toe is dressed with a thick layer of gauze soaked in paraffin. The operation is assisted by the use of a tourniquet. The patient returns for dressing on the day after operation, and is free of all discomfort after the second or third dressing. The gauze over the grafts is removed in 8–10 days, by which time the grafts have taken, and return to work is possible about a fortnight after operation. Dolan warns his readers against using local anæsthesia and a tourniquet in cases with definite infection. He thinks gas-and-oxygen is much safer, for injection of an analgesic may infect lymphatic channels, while the combined use of adrenaline and a tourniquet may lead to local sloughing.

[1] Canad. Med. Assoc. Jour., March, 1935, p. 298.

KITCHENER SCHOLARSHIPS

THIS year 878 applications, representing 496 schools, were received by the scholarships committee, over which Sir James Currie presides, of the Lord Kitchener National Memorial Fund. Their task is to select from candidates, all of whom must be sons of officers and men who have served in H.M. Forces, those who show evidence of exceptional ability and have submitted a well thought out and precisely worded plan of training. The service of the applicant's father and the financial circumstances of his family are taken into consideration in the award of the scholarships, their value depending on the resources already available. Candidates must be over 17 and under 20 years of age, and the advanced course of training contemplated may be for industrial, commercial, or professional careers. The list of 145 successful candidates issued on May 20th contains the names of at least 16 young men who have chosen a medical training from those open to them at approved universities or institutions of university rank. We say at least, for it is possible that some of those who are proceeding to Oxford, Cambridge, or other universities may intend to study medicine there.

In addition to the 145 Kitchener Memorial Scholarships which carry no pledge of adherence to any particular branch of a profession, are the newly established Kitchener Medical Services Scholarships. Five of these have been awarded this year, two for the medical branch of the Royal Navy, two for the Royal Army Medical Corps, and one for the medical branch of the Royal Air Force. These scholarships are granted on condition that the scholar, on becoming qualified to practise medicine and surgery, will apply *forthwith* (our italics) for a regular commission in one of the Services and will render not less than five years' actual service on full pay. The Services reserve the right to deduct at their discretion the value of his scholarship from [1] any gratuity payable to a medical officer who fails to complete 15 years' service. Those who doubt whether it is justifiable to exact a pledge from a boy before he starts his medical studies to adopt a particular branch of medicine as a career will be relieved to learn that a refund of the scholarship money will release him from all obligations. The only criticism which we would offer concerns the word "forthwith" italicised above. We understand, however, that the interpretation of this word is in practice broad enough to allow a scholar the benefit of a resident hospital appointment.

[1] See THE LANCET, April 13th, 1935, p. 912.

VICTOR MORAX

Dr. Victor Morax, whose death occurred on May 14th in Paris, was an ophthalmologist, well known far away from Paris. He was born on the banks of the Lake of Geneva, but his medical education was carried out entirely in Paris and his first studies in bacteriology were carried out in that city. In 1900 he made an official visit to Egypt, and in the following year appeared his first significant contribution to the study of trachoma, the disease on which he was later to become the prime authority. Here he showed that many of the prominent symptoms were due to superimposed infections like the gonococcus and the pneumococcus, observations which led to the clinical division of trachoma into the chronic and the acute forms. For the next quarter of a century Morax held an important official post as clinical director at the Hôpital Lariboisière and he continued there his bacteriological studies, out of which sprang the French association entitled "The League against Trachoma." This society organised the publication of a journal dealing with trachoma, summarising all important contributions on the subject made in other languages. For the last ten years this journal has appeared quarterly under the title of "La Revue Internationale du Trachome," while Morax became a member of the executive committee of an international organisation against the spread of trachoma and was an important participant in all its activities. Latterly Morax had worked at the Pasteur Institute, with which he had always been in close touch, while 30 years ago he contributed to the Annales de l'Institut the discovery of the organism known as the Morax Axenfeld diplo-bacillus. As a member of the Ophthalmological Society of the United Kingdom, he delivered the Bowman lecture in 1919 at the annual congress of the Society held in London, his subject being plastic operations in the orbital region with special reference to war wounds, when he described in detail the methods chiefly directed to such repairs of the injured tissues as could be made for cosmetic purposes. He also wrote an admirable text-book on ophthalmology, and a treatise on the bacteriology of conjunctivitis, and was a regular contributor to the *Bulletins de la Société Française d'Ophtalmologie*. To the International Congress of Ophthalmology, held in Madrid in 1933, he submitted an important report on the ætiology of trachoma, and in the month of his death the *Annales de l'Institut Pasteur* contained an exhaustive review from him upon intraocular inoculation by tuberculosis bacilli. He was both a great worker and a great man of science.

A MEDICAL VICE-CHANCELLOR

THE appointment as vice-chancellor to a university of a graduate who has been associated with its activities almost continuously for nearly 30 years is a tribute to proved merit. On the scientific side Prof. J. S. B. Stopford, F.R.S., has served the University of Manchester as professor of anatomy since 1919, having previously been lecturer and before that demonstrator; his contributions to the anatomy of the living, dealing chiefly with sensation, the sensory pathway and the blood-supply of the brain, have brought fame to his alma mater as well as to himself. The development of his department at Manchester has made the subject of anatomy a vital part of the students' medical studies. On the academic side he has shown judgment and tact as dean of the medical school and pro-vice-chancellor of the university. His promotion at the early age of 46 to a position of high dignity will be regretted only by those who deplore the loss to neurology which even a partial withdrawal of his energies from active research must imply. Prof. Stopford has been a prominent member of the General Medical Council for many years and has shown keen interest in the knotty problems of the medical curriculum.

VIENNA GENERAL SPITAL

THIS week with the help of many foreign guests every medical faculty and every medical society in Vienna is celebrating the 150th anniversary of the foundation of the Allgemeines Krankenhaus which has been identified as no other hospital in Europe with the teaching of clinical medicine. The foundation of the General Spital, as it was then known, was the act of that enlightened Hapsburg monarch, Joseph II., and in its earliest days the hospital was directed by Johann Peter Frank, who, realising that clinical teaching must be controlled by the study of pathological anatomy, appointed the first prosector to a teaching school. In a festival number of the *Wiener klinische Wochenschrift*, Prof. Wagner-Jauregg eulogises this medical statesman and Prof. Max Neuburger tells the story of the school up to its culmination at the beginning of the present century. Despite the levelling out of medical knowledge and practice the Vienna school is still making its contribution to medical thought and Neuburger finds a Vienna "nuance" in the theory and practice of all branches of medical science. The week ends with an address by Prof. Paul Clairmont of Zurich, one of the surgical technicians of our time, on the way Vienna surgery has permeated the surgical schools of the world. The festival number is evidence of the continuing liveliness of a school for which medicine everywhere has respect.

THE Lister medal for 1936 has been awarded to Sir Robert Muir, F.R.S., professor of pathology in the University of Glasgow, and he will deliver the Lister memorial lecture at the Royal College of Surgeons of England next year. This is the fifth occasion of the award, which is made by a committee representative of the Royal Society, the Royal College of Surgeons of England, the Royal College of Surgeons in Ireland, the University of Edinburgh, and the University of Glasgow in recognition of distinguished contributions to surgical science. It may be noted that it is now exactly 75 years since Lister was appointed to the chair of surgery at Glasgow.

THE People's League of Health is appointing a committee to study the influence of diet on the health of pregnant women and the relation of nutrition to maternal mortality and morbidity. It is hoped to make a thorough and wide investigation and to publish a report in due course. The office of the League is at 12, Stratford-place, London, W.1.

THE trustees of the Rockefeller Foundation have promised to give £60,000 towards the building and equipment of the proposed institute for the teaching and study of neurology at the National Hospital, Queen-square, and a further £60,000 towards the endowment of the teaching and research that will be carried on there.

COUNTY HOSPITAL, EDMONTON.—The Middlesex county council has approved in principle proposals which, it is estimated, will cost about £500,000, for modernising this hospital and for adapting Edmonton House for hospital purposes.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LIII.—PROGNOSIS IN OCULAR PALSY

THE term "ocular palsy" is used to express a condition of paralysis or paresis of one or more of the muscles which govern the movements of one eye; with these muscles may be associated the levator palpebræ superior, and the intra-ocular muscles of pupillary constriction and of accommodation.

Ocular palsy is due without exception to an organic lesion of nerve or muscle and its prognosis depends primarily upon the nature of that lesion and secondarily upon the age and recuperative power of the individual concerned; the length of time since the symptoms first appeared is also a factor.

SYMPTOMS

It is impossible to discuss this subject without some reference to its associated symptoms and also to the commoner of the causes which give rise to the condition. The chief symptom complained of by sufferers from pronounced ocular palsy is diplopia when an attempt is made to move the eye in the direction of the paralysed muscle, but in cases of mere muscular weakness patients may be unconscious of actual diplopia and may complain merely of confused vision and perhaps only of occasional giddiness. Indeed, patients complaining of giddiness should be tested for a possible ocular paresis; this especially applies to those giving a history of a head injury, and to all middle-aged and elderly people. If the internal ocular muscles are involved the pupil will be dilated and accommodative power weakened—the latter of course only in patients young enough to possess such power. A weakness of a depressor muscle is always more trying than that of lateral or elevator muscles owing to the confusion caused by looking down when walking. All varieties of muscular weakness are apt to be more pronounced when the patient's vitality is lowered, either by fatigue or illness.

CAUSATION AS IT AFFECTS PROGNOSIS

Traumatism.—In most cases the lesion is primarily a nervous one, although limitation of movement of an eye may be due to direct injury to the muscle itself, for example, by forceps bruising the external rectus in cases of difficult labour and by injuries to ocular muscles owing to perforation of the orbit by a sharp object. The prognosis in this type of direct traumatism is, as a rule, bad; the muscle does not usually recover from the injury and the development of scar tissue in cases of perforation may further impede movement.

A different type of traumatic paralysis is that which arises from head injuries, a variety only too common in these days of motor accidents. In cases of fracture of the base of the skull, one or more nerves supplying the ocular muscles may be torn across, in which circumstance complete paralysis occurs and no recovery is possible. But more frequently the muscle or muscles are not completely paralysed and gradual improvement takes place, the lesion being most probably a hæmorrhage into a nerve sheath; as the blood absorbs muscular power increases. So long as any improvement is taking place further amelioration may be hoped for, but when the condition has remained stationary for a time, say, two or three months, a return to normal is improbable.

Syphilis.—Ocular paralysis is frequently syphilitic in origin; here the prognosis depends partly upon whether the lesion is meningeal or intraneural. Meningeal gummata, which exercise pressure upon the nerves and are often multiple, react readily to antisyphilitic treatment and the diplopia is rapidly cured. Paralysis of the ocular muscles in tabetic cases may assume one of two forms: (1) a transient muscular weakness lasting a few days or weeks and gradually passing away; (2) permanent paralysis, complete or incomplete, of a single nerve or part of a nerve. Either form may occur at any stage, but the first is more common in the early and the second in the later stages of the disease. In my experience, however, permanent paralysis is the more common. From a prognostic point of view in syphilitic cases the presence of an Argyll Robertson pupil, in addition to the muscular weakness, is unfavourable, while a normal pupillary reaction augurs successful results from treatment.

The ocular paralysis of *disseminated sclerosis* is usually a transient one. In this disease the myelin sheaths of the nerve-fibres are the main object of attack, the axis-cylinders often escaping permanent damage. The prognosis of this type of ocular palsy is therefore good as a rule, complete recovery often resulting.

Ocular palsy may occur as a complication of *arterio-sclerosis and high blood pressure*, the slighter degrees of paresis giving rise to symptoms of giddiness and confusion, the greater to actual diplopia. Some improvement nearly always takes place; indeed, in my experience, most of these palsies are quite transient, disappearing gradually in the course of a few weeks. In few cases, however, a certain degree of permanent weakness is left. The actual nature of the lesion in these cases is somewhat obscure; most probably a small hæmorrhage has taken place in the neighbourhood of one of the motor nuclei. Although the prognosis as regards immediate improvement and ultimate recovery of movement is good, the outlook as regards life is bad, for a cerebral hæmorrhage may follow fairly closely on the heels of the ocular palsy.

The first symptom complained of by a patient with a *cerebral tumour* may be double vision, usually due, I think, to external rectus weakness owing to downward pressure of the brain on the sixth nerve; this is, of course, relieved by a decompression operation.

In cases of ocular palsies due to *toxic causes*, such as those complicating diphtheria and diabetes, the prognosis is good. A similar type of palsy is that following febrile diseases such as influenza and pneumonia; in these the prognosis is uniformly good. Mineral poisons, such as lead, may also affect the ocular muscles, these paralyses usually disappearing with the removal of the cause.

A somewhat disconcerting variety of ocular palsy is the *sixth nerve paralysis* occasionally met with as a sequel to a mastoid operation: in my experience the muscular weakness eventually disappears completely.

Encephalitis lethargica and *polio-encephalitis* are often complicated by ophthalmoplegia in the acute stages; in both of these conditions it is rare for the ocular muscles to remain permanently paralysed.

A certain number of cases of ocular palsy occur in which no general disease can be found and the lesion is extremely difficult to account for. These cases, which bear a resemblance to Bell's palsy, are usually ascribed to rheumatic neuritis of a motor nerve, but whatever the cause may be the prognosis of these *idiopathic* cases is uniformly good, the muscular

weakness disappearing after a variable interval of time.

Ocular palsy is associated with other *rarer nervous diseases*; in most of them the prognosis of the ocular lesion is bad; also the palsies associated with myasthenia gravis have a thoroughly bad prognosis. Quite recently it has been shown that the administration of Prostigmin causes temporary relief in myasthenic cases, but it is still too early to say whether more lasting results can be obtained.

DEGREE OF RELIEF BY LOCAL MEASURES

With regard to the question whether ocular paralysis can be alleviated by local measures, apart from the treatment of any general disease which may be their cause, the two conditions which call for treatment are (1) the diplopia, and (2) the unsightly appearance of squint caused by paralysis of a muscle.

(1) *Diplopia.*—The diplopia interfering with distant vision cannot be helped by means of prisms, as it is variable in amount, changing with every movement of the eyes. But on the contrary the distressing diplopia on reading, caused by the paralysis or weakness of a depressor muscle, can often be entirely relieved by the incorporation of a suitable prismatic correction in reading-glasses. The reason for this difference is that the vertical movement of the eyes when reading is a limited one, mainly lateral ocular movements taking place as the eyes move along the page.

(2) *Appearance.*—Operations undertaken to lessen the squint caused by a completely paralysed muscle are undoubtedly of value, especially in cases where a lateral muscle is affected. Careful tenotomy of the opposing muscle, with or without shortening of the paralysed one, will usually bring the eyes into line when they are looking straight forward.

When a diplopia remains persistent, patients often become less conscious of its presence, their discomfort or confusion becoming gradually less distressing. This is probably due to their learning to suppress the image seen by the paralysed eye; there is no doubt that young patients acquire the power of ignoring the second image more readily than older ones.

Complete paralysis of the third nerve, involving as it does ptosis and consequent covering of the eye by the paralysed lid, is the least worrying form of ocular palsy as far as the diplopia is concerned because the latter symptom is abolished by the closure of the lid.

R. AFFLECK GREEVES, F.R.C.S.,
Surgeon, Royal London Ophthalmic Hospital; Senior Ophthalmic Surgeon, Middlesex Hospital.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. J. E. Clarke to *Drake* for R.N.B.

Surg. Lt.-Comdrs. H. G. Wells and E. H. Rampling, and Surg. Lt. F. W. Chippindale to *Pembroke* for R.N.B.

Surg. Lt.-Comdr. R. W. Higgins to rank of Surg. Comdr.

Surg. Lt.-Comdr. (D.) W. E. A. Sampson, placed on the Retd. List, at own request, with rank of Surg. Comdr. (D.)

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdr. A. R. Thomas to *Tiverton*.

Surg. Lt. J. N. Matthews to *Pembroke* for R.N. Hospital, Chatham.

Proby. Surg. Lt. G. E. M. Benson to *Renown*.

Proby. Surg. Lt. C. J. T. Watson to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS

Short Serv. Commissions.—Lt. (on prob.) P. L. E. Wood is restd. to the estabt. N. I. McLeod to be Lt. (on prob.).

SUPPLEMENTARY RESERVE OF OFFICERS

G. F. E. Ramsden to be Lt.

TERRITORIAL ARMY

Lt.-Col. E. W. Matthews, T.D., having attained the age-limit, retires and retains his rank, with permission to wear the prescribed uniform.

R. H. Baker McCrae to be Lt.

A. Cowie (late Offr. Cadet, Aberdeen Univ. Contgt. (Med. Unit), Sen. Div., O.T.C.) to be Lt.

SHORT SERVICE COMMISSIONS IN THE R.A.M.C.

The following candidates have been granted short service commissions as lieutenants on probation in the Royal Army Medical Corps:—B. d'E. Barclay, M.B. Otago; N. I. McLeod, L.M.S. Queen's Univ., Ontario; G. S. Musgrove, M.D. Manitoba; D. S. Cochran, M.B. Aberd.; P. R. Wheatley, M.B. Lond. (Guy's); N. A. Flaherty, M.B. N.U.I. (Cork); T. P. O'Brien, M.B. N.U.I. (Cork); M. Kosloff, M.R.C.S. (Guy's); J. McN. Lockie, M.B. Edin.; J. J. Groome, M.B. N.U.I. (Dublin); C. Ryan, M.B. Dub.; A. Gleave, M.B. Liverp.; J. L. Gordon, M.R.C.S. (Middlesex); J. S. Kelleher, M.B. N.U.I. (Cork); W. B. Hamilton, M.B. Dub.; G. G. Robertson, M.B. Edin.; A. M. Pugh, M.B. Glasg.; J. H. Taylor, M.B. Glasg.; D. Wright, M.B. Glasg.; A. C. Cox, M.R.C.S. (Guy's); D. N. Keys, M.B. Durh.; G. C. Dansey-Browning, M.R.C.S. (St. Thomas's); A. H. T. F. Fullerton, M.R.C.S. (Birmingham); and J. P. Weir, M.B. Aberd.

ROYAL AIR FORCE

Group Capts. W. Tyrrell to Headquarters, R.A.F., Inland Area, for duty as Principal Medical Officer; and F. C. Cowtan to Headquarters, R.A.F. Middle East, Cairo, for duty as Principal Medical Officer, vice Group Capt. W. Tyrrell.

Wing Comdrs. R. S. Overton to Headquarters, R.A.F., Iraq, for duty as Deputy Principal Medical Officer, vice Wing Comdr. P. T. Rutherford; and E. A. Lumley to Headquarters, A.D.G.B., Uxbridge, for duty as Principal Medical Officer (Hygiene), vice Wing Comdr. T. Montgomery.

Squadron Leaders E. C. K. H. Foreman to R.A.F. Hospital, Cranwell, for duty as Medical Officer; C. T. O'Neill, O.B.E., to No. 3 Flying Training School, Grantham, for duty as Medical Officer.

Flight Lts. P. D. Barling to R.A.F. General Hospital, Hinaidi, Iraq; G. A. M. Knight to R.A.F. Hospital, Aden; G. M. Anderson to No. 1 Armament Training Camp, Catfoss; and C. H. Smith to R.A.F. General Hospital, Palestine and Transjordan.

Flying Offrs. R. G. James to No. 3 Flying Training School, Grantham, and G. H. Morley to Princess Mary's R.A.F. Hospital, Halton.

Flight Lt. J. D'Isney Rear is promoted to the rank of Squadron Leader.

INDIAN MEDICAL SERVICE

The provisional promotion of Maj. J. McM. Wilder is confirmed and antedated to March 28th, 1933.

PERMANENT COMMISSIONS IN THE I.M.S.

The selection committee is meeting at the India Office in June to consider applications for permanent commissions in the Indian Medical Service from well-qualified men of pure European descent (British subjects) under 32 years of age. The selected candidates will undergo a course of instruction in this country before sailing for India in the autumn. Further particulars will be found in our advertisement columns.

ST. BARTHOLOMEW'S HOSPITAL, ROCHESTER.—The income of this hospital has increased, but some £30,000 is still needed to complete the proposed extensions, which include X ray therapy equipment. The average cost per week for each in-patient was £2 17*s.* 2*d.*, as against £2 19*s.* 6*d.* in the previous year. The number of in-patients showed a slight increase and the number of new out-patients a slight decrease.

SPECIAL ARTICLES

THE MURUTS OF NORTH BORNEO

MALARIA AND RACIAL EXTINCTION

By A. J. COPELAND, M.D. Camb., B.Sc. Glasg., D.P.H.

LATE GOVERNMENT DISTRICT SURGEON, BEAUFORT AND INTERIOR, BRITISH NORTH BORNEO; FORMERLY ASSISTANT TO THE DOWNING PROFESSOR OF MEDICINE, UNIVERSITY OF CAMBRIDGE

THE Muruts of Borneo were formerly called "head-hunters" because they raided each other's villages to secure their enemies' heads, which were brought back, smoked, and hung up amongst the rafters of their large communal houses. This is an affair of the past, and under wise guidance by European district officers they have become a docile friendly people, intelligent and active, and well under the control of their headmen. But whereas their neighbours, the Dusuns, most of whom live at higher altitudes and in a more open environment, are largely on the increase, the Murut population has been steadily falling during the past eight years.[1] Dirt-borne diseases such as hookworm and amœbic dysentery, and infectious diseases such as influenza and measles, are equally common among the two races, but for the Muruts these are only last straws to break the camel's back. Their debilitated physique is everywhere associated with highly endemic latent malaria, and there is reason to think that, unless action is taken soon, this disease will soon make them as scarce as the wild Sakais of the remoter jungle districts of Malaya.

In North Borneo the Dusuns and Muruts represent the two ancient types of peoples, that is, the husbandmen and the hunters (Keith). The Dusuns live in upland plains and jungle country in the north as farmers, growing *padi* and breeding oxen and native buffaloes; they discontinued head hunting about fifty years ago. The Muruts, on the other hand, are hunters, living in the unhealthier dense jungle country in the south. They live by spearing and trapping deer, pig, and other jungle animals, by fishing in the

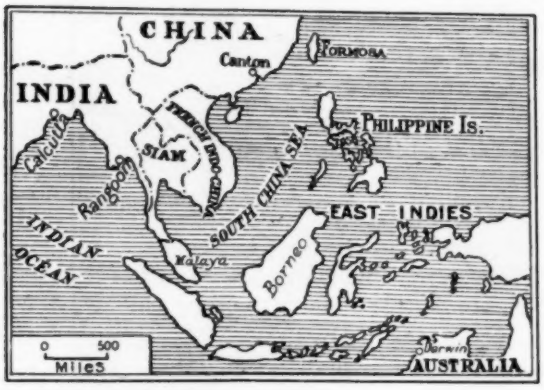

FIG. 1.—The geographical relations of Borneo.

rivers, and by raising small root and rice crops. The former number (1931 Census) 28,303 persons, the latter 21,903. There are also 3735 natives of mixed Dusun and Murut descent (the Kwijaus, around Keningau), and 2147 Chinese.

These peoples live in primitive bamboo houses roofed with native thatch or *attap*. The Dusun house is much to be preferred to the Murut type; the former is just sufficiently large for one family, and each Dusun village has many small houses. The Murut house, on the other hand, is an enormous rambling bamboo structure in which dwells, not merely a family, but the entire village (Fig. 3). This dark

[Photograph by Gaya, Jesselton

FIG. 2.—Muruts smoking tobacco.

and gloomy dwelling is supported on posts which are resting places for anopheles mosquitoes.

Medical Work in the Interior

In January, 1933, when I took charge as district surgeon, stationed at Tenom, the medical staff consisted of six dressers. These were responsible for the medical treatment of a population of some 56,000 persons. The skeleton medical service is based on six dispensaries, three for Dusuns and three for the Muruts. Of these, Tenom is now by far the best equipped (Fig. 4).

One of the pioneers of medicine in the interior was a young dresser named Mohammed Yusoph bin Samsudin, and an idea of the difficulties encountered may be gained from the following description of his experiences:

"When I was first transferred from the Coast Hospital and take charge over Tambunan Dispensary in 1921, on my first visit to a village I found mostly of the natives both sexes adults and children were in a frightful condition and dirty, their villages and dwellings were awfully bad, dirty, dampy, and very bad smell, their health and physique were very poor. . . .

"On one occasion I was ordered by the District Officer to attend to a patient a Government Native Chief in Kampong Kituntul of Tambunan District. On my arrival to that Kampong I found the patient was seriously ill passing blood and mucous stools about 15 to 20 times in 24 hours, than I told him I am going to give you an 'Obat chuchuk' otherwise you will not be cured and you may die. That is Emetine Injection, which I thought of giving it to him, he means and says 'tabak' is a word to spear, so he refuse and says to me I will 'tabak' you first and then you can 'tabak' me, so I have to return back to the Dispensary, I only send him a bottle of mixture to stop his diarrhœa, I attend to him the next day at the same time I brought my Hypodermic Syringe and needle, on arrival to his house after a while I take out and show him the needle, then he said to me he thinks it was a big needle like one of his small spear and that is the reason why he refuse to accept the injection, after he have seen the needle than he allow me to give him the injection, but still he is doubtful, he calls his people to watch and see me while giving the injection to him and he says to his people

if I die through the 'tabak' by the 'kerani' (dresser) that is the injection, all of you kill the 'kerani' too for me. . . .

"I came across to a wound case, I wanted to apply a few stitches, the patient refuse and said to me my skin is not a cloth, and how could you stitch it, I explained to him as regards to this matter, but still he refuse, and said I want 'Obat' medicine only, I can do it myself in the Kampong, so I gave him some dressing and off he went with the bleeding wound."

This intelligent dresser soon gained the confidence of the natives, and during the next 13 years, in addition to other excellent work in all parts of the interior, gave many thousands of intravenous novarsenobenzol injections for yaws. His special experience is now lost, as he has been removed to the Coast.

The next advance was made by Dr. G. G. Campbell, medical officer to Sapong Estate, when he initiated the successful yaws campaign.[1] The rapid action of N.A.B. in clearing up yaws lesions has given such confidence that many natives now demand an injection or *chuchuk* for all ailments.

MEDICAL SURVEY EXPEDITIONS

During 1933 I made five tours to many parts of the interior, accompanied by one or more dressers, with full medical equipment. In 106 days more than 3000 natives (Dusuns, Muruts, and Kwijaus) were examined and treated, medically and surgically. I was able to cover about 750 miles by pony, 250 miles on foot, and about 30 miles by native canoes. The statistical results obtained were fully confirmed by a more complete survey of 5423 natives in all parts of the Interior made during the first half of 1934 by six dressers. These workers, whose names are Mohammed Yusoph bin Samsudin, Mohammed Gani, Wong Boo Choon, Chin Hin Shing, Chin Yun En, and Andau bin Tangkim, travelled 2500 miles and visited 171 villages. Their detailed reports are far in advance of any field records previously made in North Borneo, and the work they accomplished is beyond praise.

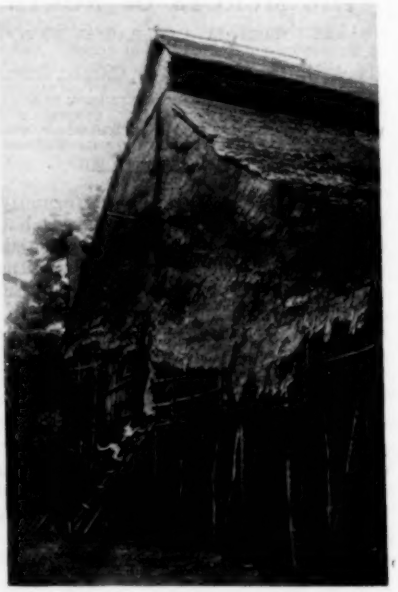

FIG. 3.—The front of a typical Murut house.

In order to make the best use of the small and scattered staff, I gradually evolved a system of temporary native treatment centres which became so popular that they came to be known as "medicine markets"—the *Tamu berobat*. It was found that two persons working together methodically to a time schedule, when their arrival had been expected, could accomplish more than three or four working indepen-

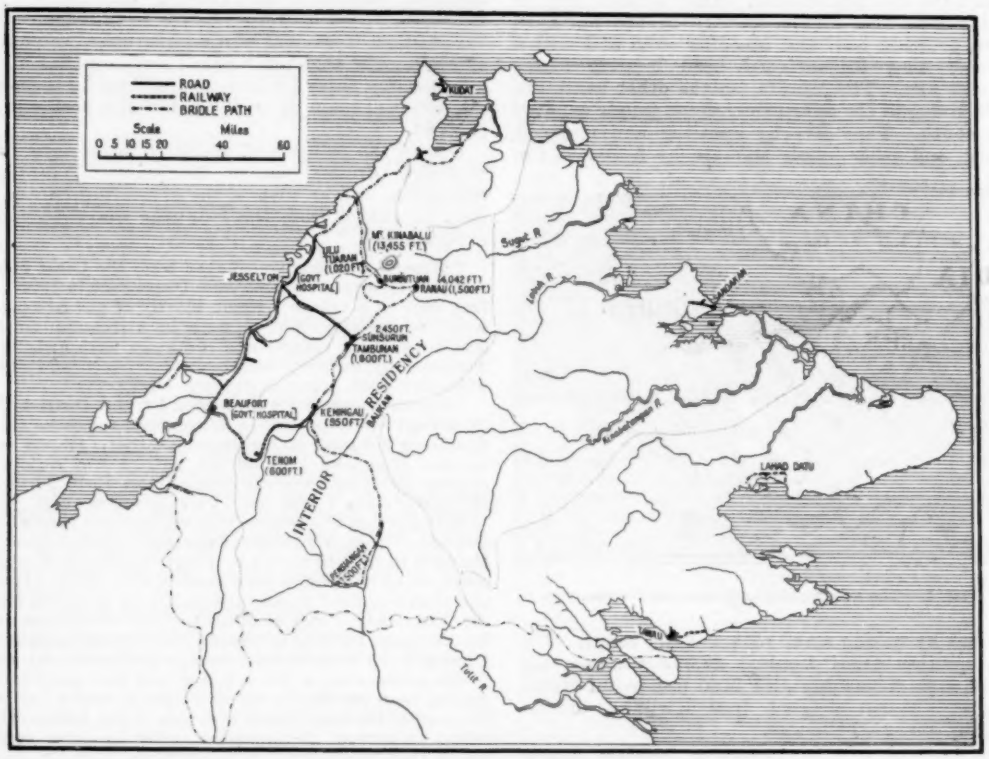

FIG. 4.—Map of British North Borneo, showing the position of the six dispensaries of the Interior Residency. Their height above sea level is indicated and their lines of communication.

dently, and with greater economy. The expeditions must be made at the time of year convenient to the natives—i.e., when they have least agricultural work. In the interior, June and November are the best months. I found it was not uncommon for a dresser

FIG. 5.—A small dispensary, with dressers and carrier.

to be unable to collect patients because the villagers were either engaged in husbandry or in communal drinking parties. For these occasions many jars of rice spirit or *tapei* are prepared, to be sucked up through hollow canes, the end-point for each pair of drinkers being the disappearance of a generous measure of water through holes in a large leaf. Muruts and Dusuns are so partial to this indulgence that all persons (excepting small children) partake in pairs in turn, day and night, until the supply is exhausted. Let the visitor, when he opens the party (as *adat* or native custom ordains), disregard the occasional passage of a bulky insect up through the tube; the polite words of thanks are, in Murut, *amis kepioh*—how deliciously sweet!

The calendar in North Borneo is the knotted rattan fibre, one knot for each day. The headmen, on their

FIG. 6.—A large temporary dispensary in process of erection by Dusuns.

return from the Government station, distribute these *timbuku* to their villagers, who cut off one knot a day. When only four or five knots are left, they come in to the treatment centre.

A medical examination, to the native, is only a tiresome and rather unnecessary preliminary to the giving of *obat*, *kapas*, and *ikat* (medicine, dressing, and bandage), but this depressing attitude is not confined to jungle folk. The necessary treatment must not, however, be delayed, lest the patient should exhaust his food supply—always carried on the person—before the trip is completed. Any examination (e.g., scientific tests such as blood groupings) which is not followed by treatment causes cruel disappointment to those who have travelled long journeys of many days, expecting medicines and dressings, and the matter is neither forgotten nor forgiven. For this reason, *any* purely scientific expedition amongst natives should always be accompanied by a dresser having local knowledge and equipped with sufficient medical supplies.

THE MEDICINE MARKET

Jungle dispensaries.—The natives are very skilful in the making of small houses of bamboo, roofed with leaves. Such a temporary *sulap* can be erected in half an hour (Fig. 5). The people willingly put up larger and more permanent places without cost, so anxious are they for treatment, and especially for quinine. The type of structure that was found to be most useful was as follows (Fig. 6):—

Length 36 ft., width 18 ft., open on one side; the whole surrounded by a fence to keep out crowds. No floor, and attap roof. Three sides carry a wide side platform,

FIG. 7.—Waiting for the medical officer (Dusuns).

4 ft. wide, at a convenient height. In the centre is a wide bamboo table 18 ft. by 9 ft. This forms a strongly built structure, useful for medical work, including the giving of large numbers of intravenous injections for yaws, and as a temporary rest-house for patients at night.

Examination of patients.—Men, women, and children were examined separately, grouped according to their villages. The method was for the natives to sit in a long line on the grass (Figs. 7 and 8). As the medical examiner approached they lay back, with the arms by the sides, and the knees drawn up. Spleen measurements were made by taking the distance in centimetres between the apex of the spleen and the costal margin. Patients whose symptoms or physical signs pointed to some complaint necessitating a further examination were noted down and seen later.

Records.—I devised a simple system which any dresser could make use of, working single-handed, and from which the spleen indices and other statistics could readily be calculated.

Temporary native treatment centre at .....
Date.....

Villages:
1. ..... Headman .....
2. ..... Headman .....
&c.

Adult males. Adult females.		Children, 2–10 years. Infants.	
Spleen not enlarged.		*Spleen enlarged.*	
Healthy.	Yaws. Other diseases.	Malaria only.	Yaws. Other diseases.
Names, &c.		Names, &c.	

Dispensing.—Bottles (always scarce) were collected at the time of examination, and a coloured voucher

was given in exchange. The bottles were grouped on the grass, and later removed to the sulap dispensary, where they were filled with the requisite mixture from concentrated stock after the first day's work. The bottles were held in position on the platform by strings of rattan, and patients were warned that persons causing these bottles to be spilt would acquire all the diseases which would otherwise have been cured! The bottles were kept back, for obvious reasons, until the completion of the hookworm treatment. The owners were then admitted a few at a time to receive medicines and dressings, and special treatments, such as the application of lint soaked in medicinal paraffin to dirty ulcers, castor oil locally for pink eye, and dental extractions. The women often file the front teeth for cosmetic effect, and the filed stumps decay and cause much trouble.

Schedule of work.—The following is typical of three days' work at a tamu berobat, or medicine market:—

First day.—12.30 P.M. to 6 P.M.: examine 80 men, 74 women, 87 children. Total, 241 persons.

Second day.—6.45 A.M. to 7.30 P.M.: examine 154 men, 132 women, 122 children (total, 408); 100 cases of yaws receive salts; 250 bottles of medicine dispensed.

Third day.—6 A.M. to 6.45 P.M.: 83 intravenous N.A.B. injections, and 7 Acetylarsan injections for yaws, after temperatures taken and urine boiled. Mass hookworm treatment for 167 men, 155 women and 120 children (total, 442). Salts at 7 A.M., oil of chenopodium at 9, 10 and 11 A.M. and salts again at 1 P.M. Gave out 250 bottles; treatments for ulcers, septic wounds, conjunctivitis, dermatitis, tinea, scabies, &c.

Fourth day.—Left Centre at 6.30 A.M.

Staff.—1 medical officer, 1 district officer, 1 dresser, 1 chief headman, 2 native policemen (total, 6).

[*Photograph by B. B. Cole Adams*

FIG. 9.—Muruts: a blow-pipe competition.

A Vanishing Race

An official report dated Feb. 18th, 1932, states that, although the figures cannot be regarded as accurate, during each of the years 1927–31 the number of deaths registered in the four Murut districts considerable exceeded the number of births. In the Dusun districts the births exceeded the deaths in 1930 and 1931, and also in 1929 at Ranau. The birth- and death-rates (per 1000 of population) are shown in Table I.

The conclusion drawn was that the Murut population was steadily decreasing, whereas the Dusun population had increased since 1930.

Mr. A. F. Richards, late governor of British North Borneo, whose encouraging interest in the work done in the interior I gratefully acknowledge, in a note dated Feb. 22nd, 1932, pointed out that "the tendency of such primitive races to decrease is a problem by no means confined to the State. The best means of combating the causes that contribute to the decline in their numbers is the provision and extension of medical facilities." What is this recent mysterious "tendency to decrease" which the equally primitive Dusuns have escaped? As possible causes of the decrease, Mr. Richards referred to bad sanitation, birth control, alcohol, and dietetic deficiencies. In July, 1933, I was able to elicit the views of the native headmen of the Baukan Murut country, when I visited their villages, and the headmen informed me that, in their opinion,

FIG. 8.—Examination of feet for crab yaws (Dusuns). Dresser on right.

(*a*) Children are noticeably fewer than ten years ago.

(*b*) There are fewer pregnant women. The reason for this was not clear to the chief headman, but he thought it was largely due to venereal disease.

(*c*) Women do not miscarry more than ten years ago, and the number of miscarriages is not great.

(*d*) *The married women want children*, and are very disappointed when they fail to achieve pregnancy. Contraception is not practised.

(*e*) They had never heard of abortion being procured.

(*f*) There are not more deaths in childbirth than there were ten years ago.

TABLE I.—*Birth-rates and Death-rates in the Interior* (*per* 1000)

—	Estimated population on Dec. 31st, 1931.	Birth-rate for 1931.	Death-rate for 1931.
MURUTS—			
Tenom	8,949	11·7	14
Pensiangan ..	9,105	17·5	40·4
Sepulut			
Keningau	9,198	21·2	23·7
DUSUNS—			
Tambunan ..	28,831	33·3	15·6
Ranau			

(*g*) The food supply is the same in quantity and variety as it was ten years ago.

(*h*) *There are more clearances of jungle than there were ten years ago.*

(*i*) *There are more cases of fever than there were ten years ago.*

I think that these last two statements contain the explanation of the "tendency to decrease."

Prevalence of Malaria

Campbell, in the report already mentioned, describes the malaria situation as follows:—

"On Estates during the years 1917 to 1925 the predominating type of Malaria was a mild Benign Tertian, with sporadic cases of Quartan and Subtertian. This was probably the type endemic to the country, and the type to which the Borneo native had developed a certain degree of immunity. With the great influx of Javanese in 1925–1927 our type of Malaria changed to a virulent and predominating Subtertian, disseminated by the new labourers, 65 per cent. of whom (even by the thin smear method) were found positive to Subtertian Malaria on arrival. The natives, as usual, journeyed down to the

TABLE II.—DISTRIBUTION OF MALARIAL INFECTION

Natives having enlarged spleens: 1934 survey

District.	Villages.	Children, 2–10.			Infants.			Adults.						
		Examined.	Enlarged spleens.	True spleen index.	Examined.	Enlarged spleens.	Infant spleen index.	Examined.		Enlarged spleens.		Adult spleen index.		
								M.	F.	M.	F.	M.	F.	Av.
MURUT.														
Tenom	8	19	13	68·4	2	2	—	91	6	31	2	34·0	(33·3)	30·9
Pensiangan, Group I.	34	134	93	69·4	28	9	32·1	406	299	251	161	61·8	53·8	58·4
,, ,, II.*	—	(86)	(84)		(12)	(7)		(402)		(328)				
Keningau	7	146	105	71·9	25	24	96·0	381	355	200	191	52·2	53·8	53·1
	49	299	211	70·5	55	35	63·6	878	660	482	354	54·8	53·6	54·3
DUSUN.														
Tambunan ..	8	95	14	14·7	15	0	0·0	120	47	48	12	40·0	25·5	35·9
Ranau	45	432	364	84·2	69	61	88·4	1168	637	659	449	56·4	70·4	61·3
Bundu Tuhan ..	8	245	20	8·1	0	—	—	180	151	47	27	26·1	17·8	22·3
Ulu Tuaran ..	16	114	17	14·9	6	0	0·0	132	120	55	59	41·6	49·1	45·2
	77	886	415	46·8	90	61	67·7	1600	955	809	547	50·5	57·6	53·0

* Group II. The Biguol and Rundum groups of villages.

Estates to find work, contracted this new and virulent type of Malaria to which no resistance had been developed, and when unable to work went home to spread it amongst their friends and relatives in the Kampongs (villages)."

The results of this change in infection are seen in the figures shown in Tables II. and III.

Predominant type of malarial parasite.[5]—The following are the results of 420 consecutive thick blood film examinations at Tenom in January to June, 1934—subtertian, 23·9 per cent.; benign tertian, 14·4 per cent.; quartan, 0·2 per cent.; mixed subtertian and benign tertian, 0·9 per cent.; negative, 60·6 per cent. The predominant malarial parasite amongst Muruts is *Plasmodium falciparum*.

Incidence of splenomegaly.—The findings set out in Tables II. to IV. have been submitted to the British North Borneo (Chartered) Company.[5] They refer to 5423 natives, of whom 1892 are Muruts and 3531 are Dusuns. There were also 500 Muruts in the Pensiangan Group II. area, but these are not included, since the records are no longer available. In regard to no fewer than 3877, including all the Muruts, the actual names of the natives and the names of their villages and headmen are recorded, together with further information as to spleen measurement and any other disease or diseases found.

TABLE III.—*Intensity of Malarial Infection*

Average costal projection of enlarged spleens measured.

District.	Numbers of enlarged spleens measured.				Average costal projection: centimetres.			
	Children. 2–10	Infants.	Adult (M.)	Adult (F.)	Children. 2–10	Infants.	Adult (M.)	Adult (F.)
MURUT.								
Tenom	13	(2)	31	(2)	8·7	(6·5)	10·8	(13·75)
Pensiangan Group I...	93	9	251	159	6·5	3·0	8·2	8·2
Keningau ..	47	16	90	111	6·1	3·5	6·7	6·3
DUSUN.								
Tambunan..	14	0	37	12	3·6	—	7·0	6·0
* ,, ..	310	0	225	120	7·2	—	9·0	9·3
Ranau ..	166	17	206	190	6·1	5·0	7·5	7·3
Bundu Tuhan ..	17	0	47	27	4·1	—	6·1	7·7
Ulu Tuaran	17	0	55	59	5·6	—	9·2	8·7

* District Surgeon's Survey, 1933, before mass treatments for latent malaria, hookworm, &c., had been given in this group of villages (both from Sunsurun, 6 miles north of Tambunan).

Of those examined, 2914 of the natives of the interior, with Ulu Tuaran and Meridi—comprising 1082 Muruts and 1832 Dusuns—suffered from spleen enlargement, and most of them from other diseases too. I saw one Murut who had enlargement of the spleen due to latent malaria with coexistent yaws, balanitis and gonorrhœa, and helminthic disease. The association of helminthic disease with latent malaria is almost universal, and to this foundation is frequently added one or even several of the following: amœbic dysentery, hepatitis, liver abscess (sometimes enormous: from one Murut I removed 6 pints 12 ounces of "strawberry fool" pus at one evacuation, using a Potain's aspirator, and he went home on the fifth day); blindness in one or both eyes due to old gonorrhœal or tropical ophthalmia, yaws (now greatly diminished in incidence), goitre, rheumatism, bronchitis, ulcers, tinea imbricata, and, in many cases amongst the Muruts, gonorrhœa. A comfortable phrase such as "the tendency of such primitive races to decrease," written in all innocence, can sometimes cover a multitude of diseases. When I toured amongst the Muruts, I was astounded that humanity could survive such multiple infections and afflictions.

TABLE IV.—*Malarial Infection and Child Population*

Child population (including infants), spleen indices, and altitudes.

District.	Children examined.	Average number of children in each village surveyed.	Child population per 1000 total pop. examined.	Approximate altitude above sea-level: feet.	True spleen indices.
MURUT.					
Tenom ..	21	3	179	600	68·4
Pensiangan I.	162	5	187	500–1000	69·4
Keningau ..	171	24	188	950	71·9
DUSUN.					
Tambunan ..	110	14	397	1800	14·7
Ranau ..	501	11	217	1500	84·2
Bundu Tuhan	245	31	425	4042	8·1
Ulu Tuaran ..	120	7	323	1020	14·9

GENERAL CONSIDERATIONS

Quinine has been, and is doubtless still, distributed amongst the inhabitants of the interior. The amount provided, however, is such that one can only describe these people as *an untreated population*. The statistics

summarised in Tables II. to IV. are of all the more interest because the 56,000 inhabitants are spread over some 6500 square miles comprising areas widely contrasted as regards country (jungle and open uplands), altitude (between 600 and 4042 ft.), native dwellings (large communal and small family), and types of native (hunters and husbandmen). Four main conclusions can be drawn :—

(*a*) Malaria is highly endemic amongst all the Muruts, but of low endemicity amongst the Dusuns, except the Ranau Dusuns, amongst whom it is hyperendemic.

(*b*) There are two types of district in the interior. In Type I. a high spleen index is associated with a high or even higher infant spleen index, and a high adult spleen index in which the adult female index is nearly equal to or sometimes higher than the adult male index. Type II., on the other hand, has a low spleen index, associated with a negative infant spleen index, but with an adult spleen index higher than the true spleen index. In this type the adult male spleen index is higher than the adult female spleen index. The exception is in the Ulu Tuaran, where the women work as tobacco carriers (Fig. 10), and travel further from home than the men. I suggest that in the first type the principal source of infection is in or close to the dwelling place, while in the second type the houses are less malarious. It is, of course, obvious that in an untreated community the distribution of malarial infection amongst groups of individuals living or working in close proximity to anopheles breeding places must bear some inverse

[*Photograph by Gaya*

FIG. 10.—Dusun women from upland districts carrying tobacco.

ratio to the average number of "danger hours" passed in safe or safer zones, and the converse must also be equally true. By "danger hours" I mean the hours of feeding of the local female anopheles mosquitoes.

(*c*) The intensity of infection, estimated by the average spleen enlargement, appears to be greatest in the Tenom and Pensiangan districts—i.e., in the districts nearest to the rubber estates. This confirms Dr. Campbell's clinical findings.[1]

(*d*) The extremely low child population amongst the Muruts, and also amongst the Ranau Dusuns, is shown in Table IV. The scarcity of children was very noticeable in the Baukan country east of Keningau when I visited the villages. The Table suggests strongly that malaria is *the* vital factor in the causation of a low child population in the above areas. The figures are not exactly accurate, but give an idea of the comparatively low child populations in the worst malarious areas. They provide, in fact, ample evidence of the truth of Campbell's saying that the Muruts are "doomed to slow but inevitable extinction, unless given systematic and energetic medical aid."[1]

In the tropics, when malarial infection becomes general in young children (Fig. 11), or when a virulent parasite is introduced, and becomes established, the situation needs at least as much attention as a dangerous epidemic receives in Europe.

FIG. 11.—A Dusun boy with malarial splenomegaly.

WHAT IS BEING DONE

Apart from weekly antilarval oiling at Tenom and Keningau stations, the campaign against malaria is carried on entirely by the distribution of drugs from the six dispensaries. (Two of these have hospitals with 16 beds, and two others have rest-houses for patients.) Quinine sulphate is the remedy chiefly employed and gives satisfactory results administered as a powder in capsules. The quantities allotted in 1932, and during the first nine months of 1933, are shown in Table V.

In addition a small amount of quinine bihydrochloride and quinine ethylcarbonate (Euquinine) is available. The cost of quinine sulphate in North Borneo is approximately 37*s.* per pound; this is 680 ten-grain doses, and according to Bass[2] is sufficient for the disinfection of 10 adults when spread over eight weeks. On the basis of Bass's figures therefore the cost of disinfection for each adult is 3*s.* 8*d.* in

TABLE V.—*Quinine Sulphate (lb.) Allotted to North Borneo Natives* [3]

	1932.	1933 (9 months).
Murut districts (population 27,252) ..	31	17
Dusun districts (population 28,831) ..	36	22½
Total (population 56,083)	67	39½

North Borneo. To this must be added the cost of 15 tablets of Plasmoquine (1*s.* 2*d.*) for complete sterilisation, making a total of 4*s.* 10*d.* for the complete sterilisation of one adult. The cost of ridding 22,000 Muruts of malarial parasites would consequently be £5316; whereas the cost of the quinine actually supplied in 1932 to the three Murut districts, to a population of 27,252 (including Kwijaus and 2147 Chinese), works out at £57 8*s.*

Each adult male native pays a poll tax of 2*s.* 4*d.* per annum to the British North Borneo (Chartered) Company, in whose hands the government of the country rests. This company, the last of the chartered companies, is answerable to its shareholders in matters of finance. The poll tax is a hardship, as the Muruts have great difficulty in disposing of their jungle produce (rattan, resin, camphor, &c.) to the Chinese for cash instead of by the usual barter. The healthy looking cheerful aborigines of Australia have a monthly allowance of groceries, free blankets, and are exempt from taxation. The last privilege might be granted the

Muruts and Ranau Dusuns, in view of their extreme poverty and debilitated physical condition.

Conclusions

(1) The Murut race is steadily decreasing; it has a low birth-rate and a high death-rate. (2) Malaria is highly endemic amongst the Muruts, and hyperendemic amongst the Ranau Dusuns, and the high true spleen-rates are associated with serious infection even among the youngest infants. (3) Insufficient quinine is allotted to these natives, numbering about 22,000 persons; the amount of quinine sulphate distributed annually is less than 50 lb. weight. (4) If this race is to be saved, the distribution of quinine must be much increased. (5) It can conveniently be distributed by the method of the "medicine market," or by individual headmen. (6) Muruts and Ranau Dusuns should now and for ever be granted exemption from poll-tax or any other form of direct taxation.

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SCOTLAND

(FROM OUR OWN CORRESPONDENT)

ANTERIOR LOBE OF THE PITUITARY

At a recent meeting of the Edinburgh Obstetrical Society Dr. J. H. Biggart, pathologist to the Scottish Asylums Board, described investigations he has made on the basophil cells of the anterior lobe of the pituitary. After castration in the human, he said, the anterior lobe shows an increase in basophil cells, and coarse vacuoles appear in these cells. Since there are at present no histological criteria of the activity of secretion in the pituitary gland, Dr. Biggart has studied the occurrence of this vacuolisation. As many as 1000 human pituitary glands have been examined from this point of view, and he has found that there is no correlation between the occurrence of this change and the presence of toxæmias, septic processes in the gland or brain, tuberculosis, encephalitis, or vascular lesions. When the change was considered in relation to the patient's age it was found that in women the vacuolisation was constantly present after the menopause. The changes in the men, however, did not show a similar age-incidence, and Dr. Biggart suggests that there is some relationship between vacuolisation in the male pituitary gland and the activity of the seminal epithelium. On counting the basophil cells in various cases, he notes that these cells are greater in number after the menopause, but the increase is much less than that seen after castration. No correlation could be found between basophil invasion of the posterior lobe and hypertensive conditions, and Cushing's observations on the occurrence of this change in eclampsia were not confirmed.

Dr. Biggart thinks it probable that the basophil cells manufacture and store part at least of the gonadotropic hormone, but conclusions about the functions of these cells are made difficult by the fact that they react to other conditions, such as Addison's disease and nephritis. His investigations do not confirm Woollard's contention that the basophil cells merely inhibit the activity of the eosinophils.

FULL-TIME MEDICAL SERVICE FOR THE POOR

The public health and public assistance committees in Glasgow have decided to advise the corporation to organise a full-time medical service for the poor. This work is at present undertaken by doctors on a part-time basis. The local division of the British Medical Association has advocated a system similar to that of the panel under the health insurance scheme, but the majority of the counsellors, who have made a special study of the situation, have preferred to recommend that the work be undertaken by a permanent medical staff. The estimated cost of the service is £20,000 a year.

RED CROSS SOCIETY

The latest annual report of the Scottish branch of the British Red Cross Society states that there are now over 4000 members enrolled in the detachments, and of these over 1000 have undertaken to serve in any part of the world to which they may be sent on the outbreak of war. Much attention has recently been paid to the training of members for first aid in chemical warfare, and 800 members have already undergone such training.

PARIS

(FROM OUR OWN CORRESPONDENT)

PROF. JEANSELME

The death of Jeanselme removes a man prominent in French medicine. On the subjects of dermatology, venereal disease, and leprosy he was encyclopædic, and his authority in these spheres was unchallenged. At the time of his death he was engaged on a monumental study of syphilis, four volumes of which have already appeared, while four others are either in the press or still incomplete. In the campaign against venereal disease he was an advocate of the regulation of prostitution, and over this subject he broke many a lance with the abolitionists. His attitude was, however, always judicial, and his strong historical sense gave him a perspective which saved him from many hasty conclusions. In collaboration with Burnier he did much to develop the venereal disease dispensary which he organised as an information service. Thanks to the statistics obtained from this source, he was able to show that, in the Paris area, the decline in syphilis between 1920 and 1924 was followed by a rise traceable to the too early cessation of treatment, to the development of clandestine prostitution, and to lack of sex education among women. He was, in fact, a great believer in sex education as a weapon against venereal disease. His interest in the history of medicine was not confined to syphilis, and he was president of the French Société d'Histoire de la Médecine in 1920 and 1921. He was also one of the founders of the Société Internationale d'Histoire de la Médecine, and he presided over its congress in Paris in 1920. Among his historical studies was one on the influence of disease on the military campaigns of history. Indeed, the history of medicine was Jeanselme's greatest preoccupation during the latter part of his life.

CORRESPONDENCE

MEDICAL REFEREES AND MINERS' NYSTAGMUS

To the Editor of THE LANCET

SIR,—Probably many medical referees for ophthalmic cases in coal-mining areas have often felt the need for the help of a physician in dealing with cases of miners' nystagmus. These cases are regarded by some as exceptionally difficult cases to decide. The chief objective symptom of the disease is ocular, so that these cases are rightly assigned to an ophthalmic medical referee for decision. But at the same time the actually disabling symptoms are frequently dizziness, headache, and nervous symptoms, which hardly come within the province of an ophthalmic surgeon to measure and assess. In elderly patients, for instance, who may still have some oscillations of the eyes, the dizziness is frequently due to arterio-sclerosis or other senile changes. In such a case the help of a physician's examination and advice is most welcome.

Although I had been a referee dealing with miners' nystagmus cases since 1920, it was not until three or four years ago that I realised that facilities were already provided by the regulations for a medical referee to obtain "expert assistance" in cases where he required it. Since then I have repeatedly availed myself of the opportunity so afforded of obtaining a physician's assistance in difficult or doubtful cases. Recently I discovered that my fellow referee, who was senior to me in length of service, was not aware of the existence of such facilities in the regulations. He agreed with me that in many cases of miners' nystagmus a physician's help would be most useful to the referee. Indeed, the proportion of such cases is so great that the question arises whether it would not be advantageous to have a physician associated with the ophthalmologist in every case of miners' nystagmus.

The present procedure laid down in the regulations is for the medical referee to apply to the Under-Secretary of State at the Home Office for authorisation of such "expert assistance" in any case where he considers it necessary. This has never been refused in my experience. One reason why one does not ask for it perhaps more frequently is that it involves a delay of about a week before the case can be decided, and puts the workman, who often comes from a considerable distance, to the trouble of a second attendance. This objection could be obviated if the regulations could be amended by permission being given to the medical referee to obtain a physician's assistance at once on his own discretion in any case where he considered it advisable. In one case recently where this was done without waiting for authorisation to be obtained, this action was approved by the Home Office under the circumstances.

In some quarters there is at present considerable dissatisfaction with the working of the Workmen's Compensation Act in cases of miners' nystagmus. I am informed that the men would have more confidence in decisions given in their cases if a physician were associated with the ophthalmic referee. Any step which may help to promote peace in this important industry deserves consideration.

I am, Sir, yours faithfully,

Sheffield, May 18th. HERBERT CAIGER.

ÆTIOLOGY OF ACUTE RHEUMATISM

To the Editor of THE LANCET

SIR,—The entirely new work by Drs. B. Schlesinger, A. G. Signy, and C. R. Amies is of the greatest interest. Such work, I venture to think, is not to be dealt with by facile criticism. At its best it will be one of those pioneer efforts which are leading us towards a new attitude to the problems of infection: at its worst it will infuse new blood into the pressing need for the study of rheumatism, a goal which many of us are only glad enough to have striven to reach. This may mean a new phase in the history of the study of rheumatic diseases, and, arising out of the useful summary of this paper in THE LANCET, p. 1162, I take this opportunity to ask you to allow me to do justice to myself and all who worked with me or assisted in those earlier days by correcting a general view often entertained of our work. We did much more for the reputation of this country than discover "the *Micrococcus rheumaticus*" which "was in all probability *S. viridans*." Guided by the work of former great clinicians I say without hesitation that we made the subject of juvenile rheumatism and some aspects of chronic rheumatism into tangible and attackable entities and revolutionised them for all time. Anyone who has honoured me by glancing through "Researches on Rheumatism" (1913) will know that neither the late A. Paine nor I believed in the "specific" streptococcus, but we believed the *disease* to be as near "specific" as any disease in childhood. Heaven knows what people imagine by a "specific" streptococcus. Again, although in 1899 I was the first to discover the essentials of what is now the Aschoff nodule I did not nor do I now believe in a "specific" lesion called the Aschoff nodule or body. There may be a specific necrosis.

They may have realised from that book certain key points in the problem of rheumatism which must always have bearing and be met. For examples: A paper by Dr. G. F. Still and myself in 1899 showing that the most severe effects of the rheumatic poisons in a subcutaneous nodule were tiny areas of necrosis thus confirming earlier Scandinavian investigators. That is a key point. Is the necrosis or the Aschoff body the essential lesion? I hold firmly the necrosis. Then, for the first time in this country came the isolation from rheumatic lesions and rheumatic living blood of a micrococcus that produced cardiac lesions, arthritis, &c. Those are key points, which medical historians will admit are key points in the history of heart disease and orthopædics. Even if the explanation is at fault those facts for this country and for cardiologists are, to use a horrid term, epoch-making. Again in 1900 in that book we demonstrated for the first time in this country, as far as was then humanly possible, the local focus (the tonsil) in rheumatism. This is a key which has often been turned by physicians and surgeons, not always to the advantage of the rheumatic, but to the advantage of the users' scientific reputations. That demonstration of the local focus is a key point: and indeed also a land mark. Again in part III. of that book there is a key point, the application of the scientific work to the human disease. It is the first essay ever written of that kind in England, and though I wrote it myself, I claim it is still hard to beat—but has to be beaten—as an explanation of juvenile rheumatism. Lastly there is one key point, at present rejected

with indifference by almost all—one which I know my friend Dr. Schlesinger, kindly and long suffering though he is, cannot swallow even if a key point is swallowable. It is this, and I believe it to be *the* key point: malignant endocarditis often follows earlier cardiac rheumatism, and I maintain there is a rheumatic form owning the same streptococcal cause. A pathological child can find the micrococci in those vegetations and *if* there is a rheumatic malignant endocarditis then one cause of acute rheumatism is a streptococcal infection.

The various types of streptococci found in laboratories do not worry me more than do the sugars that are fermented because my concern has been and is a horrible human disease. I will, however, disarm criticism by admitting all laboratory tests are "specific" and continue unmoved with the study of a disease. My determination is to fight the view that all my co-workers and I have spent nearly 40 years only to claim we have discovered a "specific" *Micrococcus rheumaticus*. It is a slur on English medicine because it is false, and a slur on those who have rescued rheumatism from solitary confinement in a pool of "acidity of the blood" or of radium containing water, or of a culture medium. I hope and trust this virus will take us further. No one knows yet where it may lead us, but all that matters on the scientific side is the truth—on the human side the rescue of rheumatic children.

For my own part I will not have in any inevitable obituary notice this: "It is interesting that he claimed the *Micrococcus rheumaticus* as the 'specific' cause of juvenile rheumatism, but it was *S. salivarius*, or (still worse) *S. fæcalis*." Such a notice would be too British for me even when dead.

I am, Sir, yours faithfully,

London, May 18th. F. JOHN POYNTON.

STIMULANTS OF METABOLISM

To the Editor of THE LANCET

SIR,—May we call attention to a remark in Sir William Willcox's annual oration before the Medical Society of London on May 13th (reported in your last issue)? Referring to the use of dinitrophenol and dinitro-o-cresol in the treatment of obesity, Sir William states that they are such powerful poisons to the liver and kidney cells that their use should be avoided in clinical practice.

Clinically the experimental evidence very definitely suggests that the danger of these compounds is solely that in large doses they may over-stimulate metabolism. The action of dinitro-phenol has been intensively investigated by Tainter and his colleagues in San Francisco, but they have been unable to demonstrate any renal lesion arising from its continued administration to rabbits although they used the most detailed methods, such as Addis's urinary cell count and the excretion of phenolsulphonphthalein (Schulte, T. L., and Tainter, M. L.: Proc. Soc. Exp. Biol. and Med., 1934, xxxi., 1163). We would also point out that the whole matter has been the subject of a very careful inquiry by the Council of Pharmacy for the American Medical Association, and dinitro-phenol is recognised by them as a useful therapeutic agent.

Our experience with dinitro-o-cresol is very extensive, and we have never observed any change in renal or hepatic functions, even after administration for prolonged periods. As we have stated in previous publications the danger with this type of compound lies, not in its effect on the liver and kidneys, but in overstimulation of the metabolism from overdosage. We feel that the important point to be emphasised is that the real risk arises from indiscriminate use of the drug. We have repeatedly pointed out that, provided a careful watch is kept on the patient and the basal metabolic rate is measured frequently, there is no danger in their use. From experimental work on animals it has been shown that the toxicity of these drugs is solely due to their power of raising the metabolism to such an extent that death supervenes.

We are, Sir, yours faithfully,

E. C. DODDS,
J. D. ROBERTSON.

The Courtauld Institute of Biochemistry, Middlesex Hospital, W., May 20th.

TREATMENT OF PITUITARY TUMOURS

To the Editor of THE LANCET

SIR,—In your last issue Dr. Wilfred Harris states, in regard to sellar tumours, that "the only certain improvement, or chance of cure, is by operation and the excision of the cyst and of its walls, or of the tumour, if not cystic." This assertion should not go unchallenged, ignoring as it does the effects of X ray therapy. As long ago as 1909 Béclère treated pituitary tumours by irradiation, one of his patients being alive twenty years later. In your issue of April 11th, 1931 (p. 806), I described the remarkable recovery after irradiation of a patient who had suffered from severe headaches and failing vision and who was found to have a greatly enlarged sella and large bitemporal scotomata. This patient is still in excellent health nearly six years after treatment and is employed as a window-cleaner. Similar cases have been described by Nemenov and Jugenburg, Magnus, Hamann and others.

In view of these results I consider that X ray therapy should be tried in all sellar tumours before they are submitted to the risks of operation.

I am, Sir, yours faithfully,

Cambridge, May 18th. FF. ROBERTS.

SUPPLEMENTS TO THE DIET OF CHILDREN

To the Editor of THE LANCET

SIR,—Dr. M. D. Wright's letter in your issue of May 11th advances two criticisms of our paper, to which we should like to reply. Before dealing with the specific points that she raises, we wish to emphasise that they appear to be mutually destructive. It seems hardly justifiable to cast doubts on the accuracy of certain results and then to attempt to draw conclusions from them. Her first criticism is refuted by the experimental scheme employed. We specifically state that "every treatment follows every other treatment twice" in each age-group and for each sex. Thus, any effect of a particular supplement which persists into subsequent periods after that supplement has been withdrawn is compensated for. Our experiment does in fact conform to Dr. Magee's conception of nutrition as a dynamic function, since we have assessed the nutritional state of our experimental children, not by their body-weight at any one time, but by their "weight-increase *during*" a period of time. (We quote from Dr. Wright's letter.)

The second criticism is, in our opinion, a piece of special pleading. Nowhere in our paper do we make the statement attributed to us by Dr. Wright, that balanced calories are of greater benefit than vitamins. It is surely axiomatic that these factors are complementary, as are the fuel and the spark in an internal-combustion engine. What we have strongly suggested

is, to continue the analogy, that one cannot compensate for an inadequate petrol supply by providing a superfluity of sparks. It is true that the analogy partially breaks down, since one cannot as yet obtain petrol which contains its own modicum of sparks; whereas, if the calories required by the body are carefully chosen from natural sources, they contain their sufficiency of all the vitamins.

We have maintained that no single one of the factors contributing to balance can be held responsible for the results obtained with our third supplement. We have, however, drawn special attention to the value of high-grade protein and of mineral salts, since it is in this direction that other investigators agree that an average diet is most likely to be deficient.

We appreciate the suggestion made in your own annotation that it would be interesting to repeat the experiment on a wider scale.

We are, Sir, yours faithfully,

T. W. SIMPSON,
ERIC C. WOOD.

Analytical and Research Department, Virol Ltd., Ealing, W., May 18th.

TRAUMA AND CANCER

To the Editor of THE LANCET

SIR,—It seems well established that trauma is an occasional cause accounting for new growths, which develop as sarcoma or carcinoma, but what is the source of the deadly poison which sets malignancy going? The view of Dr. J. J. M. Shaw (THE LANCET, April 13th, p 860) is that the prolonged action of a stimulus to proliferation, where function is unimpaired, may be responsible for the physiological aberration which is known as malignant disease. As regards tumours, probably few outside the ranks of expert pathologists fully grasp the morbid physiology of the circulation with its puzzling problems of biochemistry, and the pathological anatomy of the blood-vessels in various new growths. Dr. Shaw has given an admirable description of much that happens. I think it is extremely likely, where there is great surrounding pressure, that a small necrosis might occur, too small to be possibly diagnosed, while at its edges the mortification would create putrescence, a virus which would turn a previously innocent condition into a malignant growth.

I am, Sir, yours faithfully,

Liverpool, May 18th. GLYNN WHITTLE.

TREATMENT OF SCABIES

To the Editor of THE LANCET

SIR,—I notice under Parliamentary Intelligence in THE LANCET that a question has been asked in the House of Commons relating to the prevalence of scabies in civil and military life. The question then may be regarded as one of general public interest. If, as seems probable, a knowledgable layman were to ask a dermatologist what were the scientific reasons why sulphur was used in this disease would the reply be satisfactory to either party? The problem is the superficial infestation by a mite and its eggs of an accessible part of the body, and the application of the most potent pesticide, and at the same time the least injurious, to the host.

The ideal result is, of course, complete disinfestation on the spot. But sulphur cannot claim any primacy among insecticides; it may be definitely irritating to the skin; and in its use as an ointment is a tedious, roundabout, and messy way of getting at the object. There is a large range of possible alternatives. I wish to draw attention to two. The first is orthodichlorbenzene, bearing the recommendation of the Imperial Chemical Industries Company as a killer of the furniture beetle, *Anobium paniceum*, as well as a repellant, owing to its volatility it ought to be able to penetrate the mite's burrows. The second is of American origin and is marketed under the name of Carboxide. It is a combination of ethylene oxide and carbon dioxide, and is used as a fumigant inside a closed chamber for ridding books and furniture of the same beetle.

It ought to be possible to contrive a case in which the forearms could be placed, and into which carboxide could be introduced. The Army Medical Department, which can command the assistance of entomologists and parasitologists, may have evolved some efficient pesticide. The result of their efforts has not appeared in current civilian practice, or in the modern text-books.

I am, Sir, yours faithfully,

Belfast, April 29th. R. M. FRASER.

TETANUS AND PUBLIC INTEREST

To the Editor of THE LANCET

SIR,—A London newspaper has published under large headlines the fact that I have treated and failed to cure a case of tetanus, and I have been asked by a high academic authority why it is that my name has come into the lay press so repeatedly recently. The answer, I think, is that the words "tetanus," "fatal," and "poison" have an exciting effect upon the sensational press of this country, to a degree that not readily will these organs respond voluntarily to a plea that public interests are not well served by publications which hamper difficult and trying research work. Last week an inquest was reported on a case to which exceptional facilities and skill, and unremitting effort, had been brought by the nursing and medical staff of a senior London voluntary hospital. I did not attend this inquest, but my name was mentioned, and, as a result, I was telephoned by the editorial department of the paper in question and asked for an interview. I refused to give this, and gave as my reason that it was not in the public interest that publicity should be given to a series of inevitably fatal cases of tetanus, while we were trying to wrest from their study and treatment a new means of saving life. The result was the headlines of which I complain.

Tetanus is rare in this country. But it is the cause of a high mortality in many parts of the world, and an improvement in its treatment is urgently needed. I believe that the treatment already evolved in the study of half a dozen patients—an intravenous curarine drip which allayed the spasms of this last patient for 20 hours—demands that we should go on. But if every case is to be heralded by press trumpetings our work becomes much more difficult. In the belief that serious reporting of matters of scientific interest was worth encouraging, I once gave a lengthy interview to the Press Association on the whole complex subject of curare. It was skilfully taken and appeared undistorted and almost entirely accurately in one newspaper—and in a grotesquely sensational form in every other daily and weekly newspaper in which I saw it. The public has a right to know the progress of important scientific matters. Could there not be an authentic repository of information which could be given to journals as "official"; other channels being stigmatised as improper, unauthentic, or of editorial invention?

I am, Sir, yours faithfully,

RANYARD WEST.

University Department of Pharmacology, Oxford, May 20th.

ERGOTOCIN

To the Editor of THE LANCET

SIR,—Of the two notes on ergotocin which have appeared in your esteemed journal (March 30th, p. 758, and April 6th, p. 848), the first conveyed the correct impression, that the *crystalline* substance is being prepared in large quantities by the Eli Lilly Company. Incidentally, a photomicrograph of crystalline ergotocin appeared as a front cover cut on the *Journal of Chemical Education* for March, 1935, followed by an explanatory note in the May number of that publication (p. 238).

We have studied the chemical properties of ergotocin extensively and have made considerable progress towards ascertaining its structural formula, but would prefer to complete the task we have outlined for ourselves before undertaking a detailed discussion of the chemistry of the substance. Nevertheless, two observations may shed some light on the possibility that ergotocin and ergometrine, isolated by Dudley and Moir, are related or in part identical. Ergotocin melts, with decomposition, at 158–160° C. Ergometrine is reported as decomposing at 150–152° C. In our experience ergotocin is uniformly effective for all human patients in oral doses of 0·3–0·35 mg., and the recommended clinical dose is 0·4 mg. Dudley and Moir recommend 0·5–1·0 mg. doses of ergometrine.

An unnamed and hitherto unreported material obtained by us by a different method of extraction seems to bear a closer resemblance to the ergometrine of Dudley and Moir. This substance melts, with decomposition, at 152–155° C. Although comparable in potency with ergotocin when administered intravenously (doses, 0·1–0·2 mg.), the material is effective orally only in doses approaching 1·0 mg. Whether the difference between this material and ergotocin is one of purity or of chemical constitution is a question which we cannot yet answer authoritatively.

We are, Sir, yours faithfully,

M. S. KHARASCH,
R. R. LEGAULT.

George Herbert Jones Chemical Laboratory, University of Chicago, May 8th.

STRICKLAND GOODALL MEMORIAL

A FURTHER letter signed by Viscountess St. Cyres and others (see THE LANCET, April 13th, p. 905) informs us that the fund instituted to perpetuate the memory of the late Dr. Strickland Goodall by a lectureship and medal held under the auspices of the Apothecaries Society is to be closed on June 30th next. Those who wish to contribute should send their donations before that date to the hon. treasurer, Strickland Goodall Fund, Westminster Bank, Harley-street, London, W.1.

PUBLIC HEALTH

DIPHTHERIA CROSS-INFECTION IN A SCARLET FEVER WARD

BY THOMAS SEAGER, M.B.

ASSISTANT RESIDENT MEDICAL OFFICER, CITY HOSPITALS, FAZAKERLEY, LIVERPOOL

SOME particulars of cross-infection with diphtheria in a scarlet fever pavilion of this hospital may have a bearing on recent correspondence in THE LANCET under the title The Problem of Diphtheria.* In Block X there were 48 children, 27 boys and 21 girls, in two separate wards. Owing to a persistent purulent nasal discharge swabs were taken from the nose and throat of a boy, A. B., and examined for diphtheria bacilli. The nose swabs gave a positive culture.

Type = Gravis in each case.

No.	Source.	Virulence.	Schick.	No.	Source.	Virulence.	Schick.
1	Nose	+	Not done	33	Nose	+	Neg.
3	Nose	+	Neg.	35	Nose	+	,,
7	Nose	+	,,	37	Nose	+	Pos.
9	Nose	+	,,	38	Throat	+	
13†	Nose	+	Pos.	39	Nose	+	,,
16†	Throat	+	Neg.	40	Throat	+	
19	Nose	+	,,	41†	Nose	+	Neg.
23†	Nose	+	,,	42	Throat	+	
25†	Nose	+	,,	49	Nose	+	
26	Throat	+		50	Throat	+	,,
29	Nose	+	Pos.	91	Nose	+	
31	Nose	+	Neg.	92	Throat	+	,,

Remarks.—Numbers bracketed refer to the same patient. All other swabs were negative. Nos. 9 and 13 later gave a *gravis* organism from the throat. In Nos. 29 and 40 there was a slightly atypical colony formation. In cases marked (†) there was a history of having been "inoculated" against diphtheria before admission to hospital, though full confirmation had not been obtained. In all, 11 children out of the 48 had been inoculated. Four girls and one boy amongst the swab-negative children were Schick positive.

* Owing to later necessary revision of findings, certain preliminary figures supplied to Dr. Stallybrass and quoted in his letter in THE LANCET of May 4th (p. 1070) were incorrect.

On the morning the laboratory report was received, C. D., a convalescent girl, developed an inflamed throat which suggested incipient diphtheria. Nose and throat swabs were taken for culture. At the same time a complete bacteriological survey of the block was made, swabs being taken of nose and throat in every case, and of ear discharge where present. All the children were Schick tested, with the exception of one boy where parental consent was withheld, and positive reactors were immunised by serum injection. With the assistance of Prof. H. D. Wright of the University department of bacteriology, who undertook the laboratory work, a complete investigation of the virulence and type of organism was made.

Swabs were numbered consecutively, 1–60 being from the boys' ward, and 61 onwards from the girls'. Seventeen carriers were thus discovered among the 27 boys; one case only and no carrier among the 21 girls. The points which stand out are:—

(1) The comparatively small number of Schick-positive children (9, or 19 per cent.).

(2) The surprisingly high number and proportion of *gravis* carriers (17, or 63 per cent. in one ward; 35 per cent. if the whole pavilion is considered). This is probably to be related to the fact that the primary source of infection was a nasal case with profuse discharge.

(3) The indication that a *gravis* infection even in a Schick-negative community leads to a large increase of temporary carriers.

(4) The high proportion of positive nasal swabs.

(5) There was no appreciable difference between the proportions of inoculated and uninoculated patients that became carriers (the figures are too small for exact comparison).

Now, eight weeks after the investigation was commenced, all but two of the children concerned are regarded as negative. These two have unhealthy tonsils. The girl, C. D., cleared up after 16,000 units

of antidiphtheritic serum; her illness was mild and uncomplicated.

I am indebted to Dr. A. E. Hodgson, medical superintendent of the hospital, for guidance in the clinical management of the incident and for permission to publish this account of the outbreak.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 11TH, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2052; diphtheria, 1015; enteric fever, 21; acute pneumonia (primary or influenzal), 944; puerperal fever, 43; puerperal pyrexia, 116; cerebro-spinal fever, 17; acute poliomyelitis, 5; encephalitis lethargica, 4; dysentery, 12; ophthalmia neonatorum, 72. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on May 17th was 3271, which included: scarlet fever, 996; diphtheria, 1319; measles, 32; whooping-cough, 391; puerperal fever, 25 mothers (plus 5 babies); encephalitis lethargica, 269; poliomyelitis, 3. At St. Margaret's Hospital there were 21 babies (plus 12 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 28 (1) from measles, 7 (0) from scarlet fever, 24 (4) from whooping-cough, 29 (8) from diphtheria, 46 (15) from diarrhœa and enteritis under two years, and 87 (7) from influenza. The figures in parentheses are those for London itself.

No great town reported more than 6 deaths from influenza, this was the number at Manchester; 4 deaths were reported from Leeds, Newcastle-on-Tyne, Sheffield, and Birmingham. Eight fatal cases of measles occurred at Wigan, 4 at Sunderland. Preston and Exeter reported the two fatal cases of enteric fever.

The number of stillbirths notified during the week was 293 (corresponding to a rate of 44 per 1000 total births), including 45 in London.

MEDICINE AND THE LAW

Unsuccessful Action for Negligence against Surgeon

IN Cain *v.* Davis Mr. Justice Branson rejected a claim for damages based on allegations that a surgeon had negligently left a swab or pieces of gauze in the body of a child after an operation. Mr. K. J. Acton Davis had operated in March, 1932, on the child at the Princess Elizabeth of York Hospital for Children, where he is senior surgeon. Subsequent operations were performed by other surgeons when an abscess formed. In November 1933, pieces of gauze were expelled through the operation wound. The evidence of X ray photographs, taken in January, 1933, showed no trace of a foreign body in the operation wound. Mr. W. E. Miles, consulting surgeon to the Cancer Hospital and the Royal Hospital, Richmond, stated that the fact that the wound remained healed for six or seven months was proof positive that no foreign body was present. The defence was that swabs and not gauze were used in the course of the operation conducted by Mr. Acton Davis, and that nothing was left in the child's body. On the other hand, the child's mother and the nurse who attended the child after the subsequent operation both stated that no gauze was then used for plugging the wound. The judge found that the gauze entered the child's body at a date subsequent to the first operation. "I am satisfied," he said, "that, if the onus had been upon Mr. Acton Davis to prove that the pieces of gauze were not left behind, I should have held him to have discharged that onus by affirmative proof that they were not."

Two points about the case may be worth noting. In the first place the trial took place before a judge without a jury, so that the hearing was probably shortened and there was the less temptation to introduce considerations of sentiment such as are sometimes addressed to juries. Secondly, counsel for the plaintiff seemed anxious not to impute direct negligence to the surgeon. In his final speech he observed that Mr. Acton Davis had one advantage in the witness-box because everybody would know at once that, if he had done anything negligent, he was absolutely unconscious of it at the time; the negligence alleged was the negligence of not observing something or of completely forgetting something he had done. "If," said counsel, "the court should find against Mr. Acton Davis, one hopes he will look upon himself as unfortunate rather than as one to whom the smallest stigma of incompetence or negligence is attached." This was a curiously apologetic way of pressing home the final stage of an assault upon a surgeon's professional conduct. Fortunately the assault was decisively repulsed.

Drug Addiction as an Occasion for Divorce

In the medico-legal section of a German medical weekly (Münch. med. Woch., May 9th, p. 771) is set out a decision of the Düsseldorf appeal court. A man who had years before been given morphine for relief of pain began to give himself injections and finally became a morphinist. He pawned his household goods, got into debt, and was in trouble for infringement of the law against traffic in dangerous drugs. When he could obtain no money for morphine he threatened his wife and caused her grievous bodily injuries. Article 1568 of the Bürgerliches Gesetzbuch gives as a sufficient reason for divorce when default of the duties implied in the marriage contract occasions so grave an interference with marital relations that prolongation of the marriage can no longer be reasonably expected. In this case the morphine habit was deemed incurable, although the man was not actually a psychopath. He had several times been in an institution but had always relapsed on coming out; if his morphine habit was incurable he was himself to blame for it, as he left before completion of his cure. The incurable addiction of one spouse having led to complete break-up of the marriage a divorce must be granted to the other.

The German code, it will be observed, makes no specific allusion to drug addiction as a ground of divorce. The laws of other countries are similarly silent. Chronic drunkenness is a ground of divorce in many of the States of America, in Greece, and elsewhere, and, when other elements are present, in Australia and New Zealand. In England we obstinately refuse to enlarge the grounds of dissolution of marriage, in spite of the efforts of reformers like Lord Buckmaster. Even incurable insanity, recognised for this purpose in Sweden, Switzerland, Germany, and elsewhere, is not ground for divorce in England. The attitude of our Parliament, which has shown itself hitherto remarkably unwilling to weaken the marriage tie, may be contrasted with the elastic spirit of French law. One of the grounds of divorce in France is moral cruelty (*injures graves*). The standard examples in the French courts include excessive and unjustifiable jealousy on the husband's part, refusal to keep a promise to proceed to the religious ceremony after the civil marriage, publication of seriously defamatory statements about the petitioner, and insistence on the use of contraceptives.

OBITUARY

THOMAS WALTER HARROPP GARSTANG, M.A. Oxon., M.R.C.S. Eng., D.P.H. Manch.

THE recent death of Dr. T. W. H. Garstang has removed from the profession one who played a prominent part in much medico-political work. After graduating in arts at Oxford he entered St. Bartholomew's Hospital as Jeaffreson exhibitioner, qualified as M.R.C.S. Eng., L.S.A. Lond. in 1878, was a prizeman, and for a time resident obstetric assistant at the hospital. His early work showed practical interest in obstetrics, but later he turned towards public health, took the diploma of D.P.H Vict., and held appointments as medical officer of health under a series of urban and rural district councils, and was for a time medical superintendent of a temporary fever hospital in Knutsford. But Garstang was chiefly known to the medical world for his long and important association with the British Medical Association. He was a member of the council for two periods, and of the Representative Body off and on for over 20 years, while he acted as chairman of this body from 1918 to 1921. He was elected vice-president of the B.M.A. in 1926, and was at different times a member and more than occasionally chairman of important organisations and medico-political committees of the association. At the age of 70 Garstang resigned his appointments and retired from all active participation in professional affairs.

MARY ETHEL JEREMY, M.B., B.Ch. R.U.I., O.B.E.

Dr. Mary Jeremy, whose death has been announced, was the daughter of a Dublin clergyman. She received her medical education at the London School of Medicine for Women, and graduated M.B., B.Ch. from the Royal University of Ireland in 1906. After holding certain resident appointments in London she went to India on missionary service, and became staff officer at the Memorial Hospital, Ludhiana, Northern India. She returned to England during the war and held an appointment at the Southampton War Hospital, where her excellent services were recognised at the close of hostilities by appointment as O.B.E. Later she played a prominent part in various social organisations. The medical profession has lost in her a valuable member.

THE LATE FIELDING GARRISON

THE annotation on Fielding Hudson Garrison, the distinguished bibliographer who recently died, which appeared in THE LANCET last week, has brought to us a letter written by him and inspired by the review in THE LANCET of his "Introduction to the History of Medicine." The letter was addressed to the late Dr. H. P. Cholmeley, at that time assistant editor of THE LANCET, whom he had learned to be the author of our review. He writes: "A copy of THE LANCET, containing your very generous and discriminating editorial on my book on medical history, is received, and I beg to express my cordial thanks for this courtesy. In particular, I feel more than grateful that you have emphasised my primary intention of making a guide-book or handbook of the subject rather than a profound or exhaustive treatise. In spite of my explicit avowal in the preface, some reviewers in this country have taxed me with not going deeply enough into the subject. My own studies, which have been mainly bibliographical, have been sufficient to convince me that the entire field is, as you say, almost too vast to be handled by any single man, and I did not make my disclaimer in a spirit of mock-modesty." There is no doubt that Garrison's book, and the facilities offered by consultation of the Index Medicus under his editorship, led to the publication of many of the interesting biographies of the leaders of American medicine which have appeared in the last 20 years, a number of which have been reviewed in our columns.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

The Question of Decentralising Public Health in India

IN a debate on the Government of India Bill in the House of Commons on May 13th Mr. H. WILLIAMS moved to omit Public Health and Sanitation from the list of subjects to be dealt with by the provincial legislatures. Public health, he said, was not something which had any knowledge of provincial boundaries; if an outburst of bubonic plague were handled by provincial governments working separately great danger to the public health would ensue.—The Duchess of ATHOLL in supporting the amendment recalled the admirable measures proposed by the central government for preventing the extension of an epidemic from one province to another. She cited the high maternal death-rate and the scantiness of child welfare work as arguments in favour of the need of central authority.—Mr. BUTLER, Under-Secretary for India, in opposing the amendment, said that the concurrent list met the difficulty of disease which might cross provincial boundaries. Public health had been a provincial subject ever since the reforms were introduced twelve years ago, and the Government followed the Statutory Commission in its unwillingness to take away this subject from the provinces.

The differences between the provinces as regarded the incidence of disease, followed, unfortunately, provincial idiosyncrasies. The registration of infectious diseases might have to be enforced in a different way in one province from that in which it was enforced in another. It would be very difficult, in the case of any particular disease which ravaged one particular province, for the federal legislature to pass a law which necessarily suited that province. The manner of dealing with malaria in Bengal might be radically different from the manner of dealing with it, say, in the Punjab, and he was advised by the Government's experts that it would not be conducive to the extinction of malaria if they were to insist on regulation by a Central Act of the provincial treatment of malaria in different parts of India. In order to eradicate disease and have an efficient public health and sanitary service it was essential to encourage local effort and provincial autonomy in dealing with these matters. Moreover, these public health matters depended essentially on provincial finance.

It would be possible, under an item of the Federal List, for institutions for research to be governed from the centre. That matter could be governed by federal legislation. The Government considered that the most fruitful course to pursue in dealing with these problems was that of the coördination of policy between the centre and the units. Recently a department of health had been established in Australia entirely by the process of coördination and coöperation between the units and not by any artificial control from the centre. In India they

hoped the future would follow much the same lines. Under Clause 133 of the Bill the Government had included the opportunity for the provinces to set up an inter-provincial council, and he hoped that further coördination in health policy might result. He had discussed this matter with Major-General Graham and others connected with public health in India.

Mr. ORMSBY GORE, First Commissioner of Works, said he devoutly hoped the Government of India would not try to impose antimalarial measures on the provinces, for it was of the utmost importance *not* to have uniformity in preventive measures dealing with malaria. In a rice-producing country they could not have too much water as a preventive; in a wheat-producing country, on the other hand, a maximum of drainage was required. Probably the greatest success in fighting malaria had been achieved by concentration in a limited area. Where the central government had adopted a sort of mass attack it had almost invariably failed. He deprecated blaming the failure of Indian Ministers to grow quinine in competition with Java, which had a monopoly because cinchona could be grown more cheaply there than in other places.

The amendment was negatived by 216 votes to 31.

Restriction of Ribbon Development

In the House of Lords on May 16th the Earl of PLYMOUTH, Under-Secretary of State for the Colonies, moved the second reading of the Restriction of Ribbon Development Bill. The main arguments in support of a measure of control of this kind were, he said, of a dual nature. There were the traffic and safety arguments and there was the æsthetic argument. Both types of argument were of great importance and together formed an overwhelming case for action. The figures showing the number of fatal and other accidents which had occurred on our roads during the last year or two were undoubtedly very alarming. In the last year over 7000 people were killed on the roads, and out of that number some three-quarters, he thought, had been killed in what were known as built-up areas. It was far too early to express any opinion at present as to whether the new 30 miles an hour speed limit recently imposed was likely to constitute a remedy for this state of affairs. He did not think that anybody suggested that in itself this or any other measure that the Government could take would alone solve the problem of casualties on our roads; but whether that was so or not the fact remained that ribbon development did create conditions which were dangerous and should therefore be checked. It was clearly undesirable, unpleasant, and obnoxious that the appearance of our highways and the beauty of the country which surrounded them should be impaired and very often entirely ruined by the disorganised, unsightly, and highly dangerous method of ribbon development. The communal aspect of the problem was another important point. It was obviously desirable to plan buildings in such a way as to establish villages or townships rather than to allow haphazard methods of providing the habitations of the community to grow up with all their resultant evils. While he could not regard as feasible any general legislation which would guarantee the public against losing at one place or another an uninterrupted view of the countryside, the Government certainly believed that it was within the sphere of practical politics to provide for the proper and orderly development of lands adjacent to the highway.

The Bill brought the control, so far as it concerned the acquisition of roads, into operation immediately on the passing of the Act. This was a point which they had been urged from many quarters to secure. This meant that the requirement of consent of the appropriate highway authority for building and for the formation of new means of access along the line of 40,000 miles of roads, which were the most important roads from the traffic point of view, would be applied automatically and at once. The Government thought that it would be going too far to apply this procedure automatically to the remaining 130,000 miles of roads in the country, but they had provided in the Bill that the highway authority might in the case of any unclassified road where such control would be desirable by resolution and with the concurrence of the Minister of Transport apply the provisions of this clause to that road also. Steps would doubtless be taken while the Bill was still before Parliament to draw the attention of the highway authorities to this power so that they might be in a position to act as soon as the Bill was passed into law.

AN AMENITY BUILDING LINE

This general power of control for 220 feet on either side from the middle of the road might be conveniently described as the provision of an amenity building line. But their purpose would be incompletely achieved if this provision resulted merely in setting back to a distance of 200 feet from the highway the ribbon development. What they aimed at really was to aid the highway authority to encourage ordered development, and in particular ordered group development. At the same time it was essential to provide from the more limited traffic standpoint that on the more important routes all possible steps should be taken to safeguard land which might be required to be thrust into the highway at a later date in order to provide sufficient width of road for increased traffic requirements, including where necessary dual carriage ways, footpaths, and cycle tracks, and in appropriate cases subsidiary service roads. They were accordingly taking powers in the Bill to enable the highway authority with the Minister's approval to adopt for any highway one of a number of scheduled standard widths of the road between fences. Within the standard width the highway authority was to be empowered to prohibit buildings and works of all kinds other than defined improvements of existing buildings, and powers in default were given to the Minister of Transport in cases where the authority was held to have failed to take the necessary steps for safeguarding the line of the road required for the safe and adequate passage of traffic in the future. These powers could only be exercised by the Minister after a public inquiry. The maximum standard width set out in the Bill was 80 feet from the middle of the road, which meant an all-over width of 160 feet.

CONTRIBUTION FROM THE ROAD FUND

In so far as restriction related to the standard width line—that was the land which would be ultimately required for the purposes of the highway—the Bill proposed expressly to authorise contributions in respect of compensation to be made from the Road Fund. The Bill also gave highway authorities powers for the compulsory acquisition of land adjacent to highways for the purpose of the creation of parkways and the like. The general powers of the Bill were not only conferred on county councils but also on the councils of county boroughs. They provided also for the roads for which the councils of non-county boroughs and urban districts were responsible. The Minister of Transport was anxious to include in the Bill provision for dealing with certain urgent problems of road congestion in towns. The powers of local authorities to provide parking places were enlarged so as to enable them to provide parking accommodation for vehicles in buildings or underground.

The Government had considered very carefully whether it would in any way be practicable to make the operation of the Bill retrospective in its effect, as it has been suggested to them that recent public utterances as to the urgent need for this legislation had only spurred the ribbon developer to greater activity before a new control was imposed upon him. Be that as it might—and he might say parenthetically that the Government has no definite evidence that that has been the case—they did not feel that they could properly immobilise all development, good as well as bad, between now and the date of the passage of the Bill.

OPPOSITION SUPPORT

Lord MARLEY said he supposed that everyone who had driven on the by-pass roads must have seen the dangers to traffic of the building up of these small houses close alongside roads which were intended not for small houses but for rapid traffic. They saw that every day the damage was extending and that the spread out along the main thoroughfares of ribbon development now taking place on all the most important roads aroused serious concern and called for immediate action. The remedy for these difficulties was in the development of the group system of building houses. The large development of the group system—the development of satellite towns—was again a system for preserving the great through roads for rapid traffic and for making easier and cheaper the supply of services to the new communities. The Opposition had decided that—in spite of the fact that there were naturally from their point of view imperfections in the Bill—in order in every possible way to expedite its passage through the House they would move no amendments. They appealed to the Government to be prepared to consider this only as a preliminary Bill, to be followed by an amending Bill to meet any deficiencies or defects in the working of the present measure.

The Bill was read a second time and committed to a Committee of the whole House.

Foot-and-Mouth Disease Research

In the House of Lords on May 21st Lord STRACHIE raised the question of the recent serious outbreak of foot-and-mouth disease in Dorset, and mentioned that it was desirable that the Minister of Agriculture should have power to prohibit the introduction of hay and straw or other imports into Great Britain from countries where foot-and-mouth disease was known to exist. He said that recent outbreaks had cost the country £70,000 for the slaughter of 5418 animals.—Earl DE LA WARR, Parliamentary Secretary to the Ministry of Agriculture, in his reply, said that the fact probably was that with regard to all these outbreaks there was a great variety of causes, but never had it been possible to trace infection to any one source. A foot-and-mouth disease research committee under the chairmanship of Dr. Arkwright had been examining the question. They have been particularly studying immunity and it was hoped that they would shortly issue an interim report on the source of the disease. If anything transpired from the investigation the Government would not be slow to take up any suggestions and put them into effect.—The motion was withdrawn.

HOUSE OF COMMONS

WEDNESDAY, MAY 15TH

Hospital Accommodation in Palestine

Captain STRICKLAND asked the Secretary of State for the Colonies whether he was aware that inhabitants of Tel-Aviv, Palestine, in need of hospital treatment, had in many cases to be transferred to hospitals in other parts of the country because of lack of available beds in the municipal hospital; and whether he was yet in a position to state if the government had decided to accede to the request of the municipal authority of Tel-Aviv to be permitted to provide the necessary additional and improved accommodation.—Sir PHILIP CUNLIFFE-LISTER replied: I am not in a position to confirm the statement contained in the first part of the question. As promised in my answer to a question on April 3rd, I have communicated with the High Commissioner for Palestine, but I have not yet received information as to the intentions of Government regarding the proposals for financing the enlargement and improvement of the hospital. I should add that during last year this hospital, to the cost of which the Government contributes, was enlarged from 125 to 184 beds.

National Health Insurance: New Bill Promised

Miss WARD asked the Minister of Health whether he was yet in a position to make a statement regarding the Government's proposals for dealing with persons who had fallen out of national health insurance.—Mr. SHAKESPEARE, Parliamentary Secretary to the Ministry of Health, replied: My right hon. friend hopes to introduce legislation on this subject very shortly.

Miss WARD: Is the hon. Member in a position to say that the medical side will be considered, as this matter is causing great anxiety to a number of people?

Mr. SHAKESPEARE: I do not think my hon. friend will have long to wait, but I cannot anticipate the terms of the Bill.

Mr. G. GRIFFITHS: Will the maternity side be considered?

Mr. RHYS DAVIES: May we take it that the Bill will be passed through all its stages before the end of July?

Mr. SHAKESPEARE: Obviously I cannot guarantee that, but we should like it to do so.

Diphtheria in Leeds

Mr. GROVES asked the Minister of Health whether there had been any deaths from diphtheria in Leeds children who had at any time been inoculated against diphtheria; and (2) if he would state the number of children under 15 years of age in Leeds who were inoculated against diphtheria in each of the years 1928, 1929, 1930, 1931, 1932, 1933, and 1934; the number of those inoculated in these years who gave the final Schick-negative test; and the number of those who, having been inoculated and given final Schick-negative tests, contracted diphtheria in each of these years.—Sir HILTON YOUNG replied: The following is the information furnished by the local authority on this subject:—

Year.	Children under 15 years inoculated.	Those inoculated who gave final Schick-negative test.	Those inoculated with final Schick-negative tests who contracted diphtheria.	Deaths from diphtheria in Leeds children who had been inoculated against diphtheria.
1928	92	65	Nil	Nil
1929	101	73	Nil	Nil
1930	174	152	Nil	Nil
1931	602	202	Nil	Nil
1932	1874	1379	6	Nil
1933	1372	1030	1	Nil
1934	2773	2226	4	Nil
Totals	6988	5127	11	Nil

THURSDAY, MAY 16TH

Industrial Disease as an "Accident"

Mr. TINKER asked the Home Secretary if he was aware that persons who had had industrial disease were being refused employment when they signed that they had had it; and would he consider amending Section 9 (4) of the Workmen's Compensation Act so as to make it clear that the word injury included disease, so as to enable those who were unable to get employment through having had an accident or industrial disease should be treated the same.—Sir JOHN GILMOUR replied: I am aware that colliery owners often refuse employment to men who have had nystagmus, but as explained in previous replies, the issue is by no means a simple one, and in my opinion a full inquiry into this and other questions connected with the payment of compensation for this disease would be necessary before any amendment of the law could be usefully considered.

Mr. T. SMITH: Is it the intention of the right hon. gentleman to institute an inquiry, in view of what has taken place in various parts of the country?

Sir J. GILMOUR: All I can say is that the matter is being very carefully considered at the present time.

Health Insurance (Dental Benefit)

Captain CUNNINGHAM-REID asked the Minister of Health whether, as persons insured under the national

health insurance scheme were ineligible for dental treatment until they had been paying contributions for over four years, and in view of the importance of early treatment in dental cases, especially among young persons, he would consider the alteration of these regulations.—Sir HILTON YOUNG replied: Under the National Health Insurance Acts dental benefit is not included in the statutory benefits to which all insured persons are entitled, but is an additional benefit which may be provided by an approved society having a disposable surplus as a result of a quinquennial valuation. An insured person becomes entitled to dental benefit at the beginning of the third year following that in which he joins a society providing the benefit. In fixing this waiting period regard has been had to the considerations referred to by my hon. friend, but I am afraid that any further shortening of the period would be open to serious objection not only on administrative and financial grounds but also from the point of view of equitable distribution of the surplus amongst the members of the societies.

Milk Marketing Board

Major CARVER asked the Minister of Agriculture what additional percentage of milk was being handled by the Milk Marketing Board compared with the amount handled when it started its operations.—Mr. ELLIOT replied: The average daily quantity of milk sold under wholesale contracts during the six months ended March 31st, 1935, showed an increase of 17¾ per cent. on the average daily quantity in the corresponding period of the previous year. The quantity sold under wholesale contracts in April, 1935, was 23 per cent. more than that sold in April, 1934. The information is not available which would permit a comparison between the volume of sales by producer-retailers in the six months ended March 31st, 1934 and 1935 respectively, and therefore I am unable to give a figure representing the percentage increase in the total supplies of milk coming under the Milk Marketing Scheme then and now.

Disease Carriers

Captain ERSKINE-BOLST asked the Minister of Health how many human disease-carriers were known to his department; what diseases were thus carried; and what was the general policy of his department with respect to the surveillance of such cases.—Sir HILTON YOUNG replied: The number of human disease-carriers about whom information is available in my department is necessarily small, but I am advised that most infectious diseases are capable of being carried in this way, and that all persons may be carriers of some disease at one time or another, though not of course necessarily responsible for the spread of the disease. The policy of my department is that known carriers of disease should not engage in any occupation which would render them a special source of danger to the public.

Mr. GROVES asked the Minister of Health what precautions were taken by medical officers of health to make sure that they themselves were free from infection by the hæmolytic streptococcus and could themselves carry the contagion.—Sir HILTON YOUNG replied: I am advised that the best and perhaps the only precautions that can be taken are those measures for preserving surgical cleanliness that are familiar to medical practitioners.

MONDAY, MAY 20TH

The Training of Hospital Nurses

Mr. REMER asked the Minister of Labour whether he was aware that there was a shortage of trained hospital nurses; and if he would consider allocating some portion of public funds in the distressed areas to educate and train a limited number of suitable girls as hospital nurses either in the great hospitals locally or in hospitals in the south of England.—Mr. R. S. HUDSON, Parliamentary Secretary to the Ministry of Labour, replied: I am aware that there is some shortage of trained hospital nurses in certain places. I understand, however, that the shortage is not due to any lack of training facilities as in the majority of hospitals the training is provided free.

Prevention of River Pollution

Captain CUNNINGHAM-REID asked the Minister of Health whether the Government had yet begun to prepare a River Pollution Prevention Bill; whether it was hoped that such a Bill would prove to be non-controversial; and when it was proposed to be introduced.—Mr. SHAKESPEARE replied: My right hon. friend presumes my hon. friend's reference is to a Bill to provide for the reception of trade effluents into sewers. The state of Parliamentary business precludes any measure this session, but my right hon. friend has in mind the case for such a measure, and, while he cannot say that it would be without controversy, he hopes that the negotiations which have taken place will result in substantial agreement.

TUESDAY, MAY 21ST

Inquiries into Maternal Deaths

Colonel CLIFTON BROWN asked the Minister of Health if he had considered the suggestion made at the annual meeting of the Carlisle and District Nursing Association, to which his attention had been drawn, that inquests should be held on every maternal death in order to draw public attention to the many avoidable causes of these fatalities; and what action he proposed to take in the matter.—Mr. SHAKESPEARE replied: This suggestion was considered by the Departmental Committee on Maternal Mortality and Morbidity, who did not advocate its adoption (Final Report, pp. 26–27). The committee advised that local authorities should be urged to continue the arrangements by which medical officers of health make inquiries into maternal deaths and furnish confidential reports to the chief medical officer of my department. My right hon. friend has taken action accordingly.

Methylated Spirit Drinking

Mr. LECKIE asked the Home Secretary whether he had considered a communication from Dr. Percy Turner, chief medical officer of the Salvation Army, on methylated spirit drinking; and whether, in view of the facts therein described, he proposed to carry out the suggestions made for dealing with the problem.—Mr. DUFF COOPER, Financial Secretary to the Treasury, replied: I have seen a copy of the *British Journal of Inebriety* containing an article by Dr. Turner, in which he suggests that changes in the denaturing of methylated spirits might be considered. The matter is one which engages constant attention, but on the evidence at present available I am not satisfied that any alteration is expedient.

L.C.C. HOSPITALS

The one-storey building at Hammersmith Hospital to provide suites of offices for three professors, four laboratories, and a students' common room is to be proceeded with at once, the Minister of Health having consented to the alienation of the land. The cost will be borne by the medical school.

An out-patient department has been opened at Five Elms on the Becontree estate as an adjunct to the King George Hospital at Ilford, from which doctors, nurses, and masseurs will be supplied. The Becontree health centre and out-patient department, as it is called, will provide for the treatment of accidents and other casualties, and certain minor ailments.

Some forthcoming changes of staff are announced. Dr. J. H. Whitaker, medical superintendent of the Grove Hospital, and one of the Council's small-pox diagnosis consultants, will shortly retire under the age limit. He entered the service of the M.A.B. 38 years ago. Dr. J. S. Anderson will take his place. Dr. Maurice Mitman is to be promoted to be a divisional officer in the public health department; he is at present deputy medical superintendent and radiologist at the North Eastern Hospital. Dr. A. D. Morris, at present senior assistant medical officer at the Hammersmith Hospital, will become medical superintendent of St. Leonard's Hospital and acting master of the institution.

MEDICAL NEWS

University of Cambridge

On May 17th the following degrees were conferred :—

M.D.—Henry Barcroft and G. H. Day.
M.B., B.Chir.—F. H. Coleman.

English Conjoint Board

At the recent final examination of the Board the following candidates were approved in the subjects indicated, but are not yet eligible for the diplomas of the Colleges :—

Pathology.—R. B. Abdel-Messih, St. George's; H. L. Ackerman, Lond.; I. Affleck, Charing Cross; S. G. Alavoine, Lond.; M. M. Ali, St. Bart.'s; G. A. Armstrong, Westminster; J. H. Armstrong, St. Bart.'s; S. Balasingan, King's Coll.; S. Ball, Liverp.; H. D. G. Barnes, Lond.; J. E. M. Barnes, St. Mary's; H. H. F. Barns, Univ. Coll.; Mary J. Bartlett, Roy. Free; P. N. Baruah, Manch.; L. Bass, Middlesex; A. B. Baxter, Guy's; S. L. Bhatia, Roy. Free; K. O. Black, St. Bart.'s; G. N. Blackburn, Leeds; B. E. Blair, St. Thos.; F. A. Bleaden, Guy's; Katherine M. Blenkin, Roy. Free; K. E. Bond, Camb. and St. Thos.; J. C. B. Bone, Middlesex; T. F. Bostock, St. Bart.'s; C. M. Bowker, St. George's; J. D. Bradley-Watson, St. Bart.'s; W. G. Brander, Camb. and St. Thos.; G. C. Brentnall, St. Bart.'s; A. J. Broomhall, Lond.; A. G. T. Brown, Guy's; J. C. Brundret, Manch.; D. H. D. Burbridge, Middlesex; P. J. Burke, Manch.; W. A. Burnett, Middlesex; J. C. Busby, Camb. and St. Mary's; Josephine H. Campbell, King's Coll.; N. R. Chan-Pong, Birm.; L. S. S. Chiew, Singapore; Priscilla B. Clark, Univ. Coll.; E. P. Clarke, St. Bart.'s; R. R. Clipstein, St. Mary's; D. H. Coe, King's Col.; C. D. Coode, Oxon and Lond.; G. F. Crickmay, St. Thos.; M. Curwen, and S. Curwen, Middlesex; V. R. Damle, Bombay and Lond.; C. S. Darke, Guy's; A. B. Dempsey, Lond.; P. R. Dias, King's Coll.; E. N. Dowell, St. Mary's; T. P. Eddy, Oxon and Middlesex; Dora J. B. Falconer, Roy. Free; M. Fallon, Dubl.; D. I. Forster, Roy. Free; I. M. Fradkin, Lond.; W. G. France, Leeds; Joan R. Franklin, Roy. Free; D. F. Freebody, Guy's; E. D. B. Freedman, Westminster; P. R. Gavin, St. Thos.; D. R. Gibson, St. Mary's; R. E. Gibson, St. Bart.'s; J. F. Goodall, Camb. and Leeds; J. A. T. Griffiths, Guy's; J. A. G. Gulliford, Cardiff; G. S. C. de S. Gunasekera, Ceylon and West Lond.; J. L. Haber, St. Mary's; A. B. Hamer, and L. B. Hardman, Manch.; J. C. Harland, Westminster; H. R. S. Harley, Guy's; F. Harrison, Liverp.; J. Heginbotham, Manch.; A. G. Hemsley, Middlesex; L. Henig, St. Bart.'s; M. C. B. Heyns, Univ. Coll.; F. Hirschman, St. George's; W. Hobson, Leeds; R. A. Hoey and C. S. Humphries, St. Thos.; B. W. Hunt and S. Jackson, Guy's; Gwyneth M. Jenkyn-Owen, Roy. Free; H. D. Johnson, Camb. and St. Thos.; S. J. Johnson, Univ. Coll.; A. C. Jones and H. G. Jones, Middlesex; I. Kelnar, St. Bart.'s; A. R. Kelsall, Camb. and St. Bart.'s; H. M. Kelsey, Guy's; A. S. Kerr, Liverp.; K. Inamulla, Cardiff; G. M. Komrower, Manch.; J. W. Lacey, Camb. and Lond.; L. R. Leask, St. Bart.'s; R. B. Leech, Camb. and Lond.; D. M. Leiberman, Leeds; J. I. Lesh, St. Thos.; J. L. Lewis, Lond.; S. E. Littlepage and J. M. Lockett, St. Bart.'s; S. W. Longthorne, Charing Cross; J. F. Loutit and R. D. McDonald, Lond.; K. G. F. Mackenzie, St. Thos.; J. A. Mansi, St. Bart.'s; S. Marinker, Middlesex; K. H. A. Marshall, Oxon and St. Mary's; Ivy Massick, Delhi; W. V. Maughan, Middlesex; S. C. Mehta, Lond.; I. H. Milner and M. Mirsky, Charing Cross; J. R Monks, Manch.; T. J. Morton, Camb. and Charing Cross; F. L. E. Musgrove, Guy's; T. P. Myles, Camb. and St. Mary's; M. L. Nairac, St Bart's; W. S. A. Oakes, Leeds; J. D. Ogilvie and W. A. Oliver, St. Bart.'s; Helen M. C. Palmer, Univ. Coll.; J. G. Parekh, St. George's; D. E. Parry, St. Mary's; E. N. Pearlman, Middlesex; J. Pemberton, Univ. Coll.; R. Petticrew, Leeds; W. M. Philip, Guy's; P. M. J. Phillips, King's Coll.; R. J. Porter, Camb. and Lond.; I. H. Premdas and R. R. Prewer, St. Bart.'s; D. E. Price, St. Mary's; O. N. Ransford, Middlesex; G. Rogers, Lond.; B. M. D. Rosten, K. G. Rotter, and A. N. Roy, St. Bart.'s; W. A. Royds, Manch.; R. G. Samuel, St. Bart.'s; S. H. Samuel, Leeds; L. J. Sandell, St. Bart.'s; E. Sayle, Guy's; F. Schwartz, Charing Cross; P. G. Scott, Camb. and Univ. Coll.; G. N. Sen, West Lond.; R. G. Silver, Oxon and Middlesex; I. Singh, Rangoon; M. R. Singh and A. Skolar, Middlesex; T. Smallhorn, St. Bart.'s; J. Stern, Lond.; W. Stoddart, St. Bart's; C. H. Tanner, Cardiff; R. N Tattersall, Leeds; F. B. Thomas, St. Thos.; T. A. Turnbull, Guy's; J. E. Underwood, St. Bart.'s; W. H. Valentine, Camb and St. George's; C. S. van Heerden, Lond.; Rosemary C. Walker, Roy. Free; J. H. Ward, Camb. and St. Bart.'s; S. A. Way, Middlesex; Norah E. Weatherhead, Roy. Free; H. Weiner, St. Bart.'s; W. R. Welply, Lond.; D. O. Wharton, Camb. and Manch.; E. H. L. Wigram, Camb. and St. Thos.; D. J. Wilkes, Birm.; R. R. Willcox, St. Mary's; Sheila M. R. Williams, Roy. Free; Louise F. Wilson, West Lond.; L. A. C. Wood, Camb. and St. Thos.; Rowena Woolf, Roy. Free; G. N. Wright, Guy's; and G. F. Wright, Camb. and St. Thos.

Medicine.—W. J. C. Anstie, Oxon and St. Thos.; K. E. Barlow, Middlesex; Mary J. Bartlett, Roy. Free; H. B. Birnbaum, Glasg.; A. C. Blandy, Camb. and Lond.; A. S. Bookless, Guy's; R. F. Braithwaite, St. Bart.'s; Margaret C. Briggs, Roy. Free; A. J. Broomhall, Lond.; K. P. Brown, St. Bart.'s; J. G. Clothier, King's Coll.; J. H. Cobb, Univ. Coll.; B. Cohen, Charing Cross; F. C. Collingwood, Bristol; D. Craig, St. Bart.'s; V. R. Damle, Bombay and Lond.; W. H. H. J. de W. de Wytt, Dubl.; R. C. Dolly, St. Bart.'s; E. W. Dorrell, Camb. and St. Bart.'s; C. M. Dransfield, St. Bart.'s; L. S. Dymond, Cardiff; K. G. Eckersley, Leeds; S. Fomon, Illinois; Daireen I. Forster, Roy. Free; O. P. Frank, St. George's; R. E. Gibson, St. Bart.'s; B. M. Goldsworthy, St. Thos.; J. F. Goodall, Camb. and Leeds; F. Harrison, Lverp.; Sylvia A. M. Herford, Roy. Free; R. S. Hunt, Camb. and St. Bart.'s; N. W. Irish, Guy's; E. C. O. Jewesbury, Oxon and St. Bart.'s; W. H. G. Jones, Birm.; H. S. Joseph, St. Bart.'s; A. R. Kelsall, Camb. and St. Bart.'s; A. R. Kennedy, St. Bart.'s; A. S. Kerr, Liverp.; P. T. Liem, St. Thos.; S. E. Littlepage, St. Bart.'s; D. N. Matthews, Camb. and Charing Cross; Dorothy V. Mazel, Sydney and Roy. Free; S. C. Mehta, Lond.; P. J. W. Mills, St. Bart.'s; A. H. G. Munro, Durham; N. W. N. Murray, King's Coll.; W. A. Oliver, St. Bart.'s; S. Paletz, St. George's; W. D. Park, St. Bart.'s; G. E. Paxon, Guy's; E. J. Perks, Bristol; J. Rabinovitch, Leeds; J. D. Raftery, St. Mary's; S. J. R. Reynolds, Camb. and Charing Cross; E. A. Richards, St. Thos.; E. B. Rowe, Guy's; Millicent I. Rowland, Roy. Free; R. S. Saxton, Camb. and St. Bart.'s; M. Schwartz, Univ. Coll.; C. Segalov, King's Coll.; S. K. Sen, Birm.; M. R. Singh, Middlesex; A. R. M. Waffarn, Ceylon and King's Coll.; G. L. Wainganker, Bombay and Manch.; Louise F. Wilson, Yale and West Lond.; J. R. J. Winter, Camb. and St. Bart.'s; Rowena Woolf, Roy. Free; and A. W. Woolley, Bristol.

Surgery.—H. L. Ackerman, Lond.; S. N. Ahmed, Birm.; Margaret Ball, Roy. Free; Kathleen R. Barker, Roy. Free; R. D. I. Beggs, Middlesex; Katherine M. Blenkin, Roy. Free; N. H. Bloom, St. Bart.'s; F. Braithwaite, Camb. and St. Bart.'s; A. C. Brewer, Liverp.; L. D. Brice, Manch.; B. B. Bridges, Camb. and Guy's; G. L. Broderick, Camb. and St. Thos.; L. H. Buckland, St. Bart.'s; Kathleen E. Burnell, Roy. Free; J. A. B. Burnett, Charing Cross; W. A. Burnett, Camb. and Middlesex; R. J. F. Campbell, Guy's; W. W. Cashmore, Camb. and Guy's; J. H. Caverhill, St. Thos.; N. R. Chan-Pong, Birm.; P. W. Clarkson, Guy's; F. C. Collingwood, Bristol; C. D. Coode, Oxon and Lond.; R. N. B. Cridland, Oxon and St. Mary's; N. Cruickshank, Camb. and Lond.; G. M. Curtois, Guy's; R. D. L. Davies, Middlesex; A. B. Dempsey, Lond.; T. Denness, St. Thos.; J. F. Dow, Camb. and Middlesex; C. A. Dowding, Camb. and King's Coll.; N. P. Eskell, Camb. and Bristol; R. B. Evans, Lond.; R. D. Ewing, Camb. and Middlesex; J. V. L. Farquhar, St. Bart.'s; T. S. R. Fisher, Camb. and Birm.; S. Fomon, Illino's; I. M. Fradkin, Lond.; C. B. Franklin, St. Bart.'s; G. L. Gale and J. G. Garman, Birm.; S. Glaser, Cape and Lond.; J. F. Goodall, Camb. and Leeds; S. G. Gordon, Charing Cross; C. N. Gosse, Camb. and St. Mary's; Irene G. Hamilton, Bristol; P. B. Hanbury and M. J. Harris, Guy's; G. D. Harthan, Manch.; C. W. M. Harvey, St. Thos.; J. Heginbotham, Manch.; N. J. P. Hewlings, Camb. and St. Bart.'s; Emily C. Hill, Liverp. and West Lond.; R. E. Hirson, Manch.; G. A. Hodgson, Oxon and St. Thos.; C. C. Houghton, Birm.; T. G. Humby, Guy's; M. I. Husain, Osmania and Lond.; C. A. Hutt, St. Mary's; H. D. Johnson, St. Thos.; W. W. B. Kelly-Wiseham, Middlesex; T. B. Kenderdine, Birm.; J. R. Kerr, Camb. and St. Thos.; K. C. Kershaw, Manch.; D. B. Kulkarni, Lond.; M. J. Lange, Guy's; J. I. Lesh, St. Thos.; M. J. Levi, Leeds; H. Levitt and M. Lipson, Charing Cross; O. G. Lloyd, Univ. Coll.; J. F. Loutit, Lond.; A. A. Lovell, Birm.; W. R. Merrington, Univ. Coll.; S. Meyers, King's Coll.; C. R. Morison, Camb. and St. Bart.'s; L. F. Muldavin, St. Mary's; E. G. Murphy, Univ. Coll.; W. G. Murray-Browne, St. Thos.; S. G. Nardell, St. George's); J. B. Neal, Westminster; J. G. Parekh, St. George's; W. Parke, Liverp.; A. D. Petro, Camb. and St. George's; E. H. D. Phillips, Camb. and St. Bart.'s; T. D. Pilcher, Camb. and St. Thos.; R. J. Porter, Camb. and Lond.; D. A. Prothero, St. Bart.'s; R. G. Record, Birm.; H. W. Rees, Middlesex; M. S. Richmond, Leeds; C. G. Rob, Camb. and St. Thos.; B. Roberts, St. Mary's; G. S. Robinson, Camb. and Liverp.; P. A. Robinson, Camb. and Middlesex; P. W. D. Russell, St. Thos.; A. E. K. Salvi, Guy's; H. V. Sansom, St. Bart.'s; P. G. Scott, Camb. and Univ. Coll.; G. N. Sen, West Lond.; N. S. Shtetinin, Manch.; D. Singh, Birm.; G. C. Smith, St. George's; Elsie M. Smyth, Univ. Coll.; J. B. Spearman, Guy's; A. C. Spence, Camb. and Middlesex; S. Stein, St. Mary's; Eunice Sterling, Rochester, U.S.A.; J. M. Stewart, St. Bart.'s; A. Stoller, Univ. Coll.; T. H. Taylor, Bristol; D. W. I. Thomas, St. George's; H. C. Thomas, Lond.; R. M. Thornton, St. Thos.; J. D. B. Vaile, St. Thos.; C. W. H. Van der Post and J. T. Waldie, Guy's; S. A. Way, Middlesex; W. R. Welply, Lond.; C. E. G. Wickham, St. Thos.; B. L. Williams, Camb. and St. Thos.; Sheila M. R. Williams, Roy. Free; Eugenie L. Willis, Camb. and Roy. Free; J. D. Wilson, St. Bart.'s; G. N. M. Wishart, Manch.; J. E. Wooding, Camb. and St. Bart.'s; and P. M. Wright, St. Bart.'s.

Midwifery.—H. Acton, Middlesex; M. M. Ali, St. Bart.'s; G. A. Armstrong, Westminster; J. D. F. Armstrong, St. Mary's; S. Balasingan, King's Coll.; D. R. Balcombe-Brown, Oxon and St. Thos.; H. F. Barnard, Westminster; P. N. Baruah, Manch.; R. H. Bembridge, King's Coll.; A. M. Bennett, Charing Cross; L. J. Blay, Guy's; D. Bobker, Charing Cross; A. W. Bone, Camb. and Lond.; J. C. B. Bone, Middlesex; R. E. Bonham-Carter, St. Thos.; F. Braithwaite, Camb. and St. Bart.'s; Margaret C. Briggs, Roy. Free; R. H. W. Britton, St. Thos.; G. R. H. Brown, Lond.; J. L. Brown, Liverp.; D. H. D. Burbridge, Middlesex; A. Z. Butt, St. Bart.'s; R. J. F. Campbell, Guy's; R. S. Castle, St. Thos.; J. G. Clothier, King's Coll.; B. Cohen, Charing Cross; E. R. Coleman, Univ. Coll.; T. K. Cooke, Leeds; J. D. Cooper, Camb. and Lond.; Gwendolen K. G. Coote, Univ. Coll.; N. Cruickshank, Camb. and Lond.; M. Curwen, Middlesex; L. F. Dale, St. Bart.'s; C. S. Darke, Guy's; H. K. Dastur, St. Bart.'s; C. W. Dixon and G. G. Doel, King's Coll.; E. N. Dowell, St. Mary's; V. K. Drennan, Liverp.; R. W. Dunn, St. Bart.'s; L. S. Dymond, Cardiff; T. P. Eddy, Middlesex; N. P. Eskell, Camb. and Bristol; C. D. Farris, Guy's; E. L. Fisher, St. Bart.'s; W. A. J. Fox, Westminster; D. F. Freebody, Guy's; E. D. B. Freedman, Westminster; G. L. Gale, Birm.; T. H. T. Gautby, Camb. and Middlesex; A. C. Gee, Westminster; Joyce M. George, King's Coll.; A. W.

Gibbons, Guy's; P. W. D. Goddard, St. Thos.; J. B. M. Green, Oxon and St. Thos.; L. Greenbaum, Lond.; S. G. Griffin, Liverp.; J. A. T. Griffiths, Guy's; Ann A. Guest, Birm.; G. N. St. J. Hallett, St. Thos.; J. C. Harland, Westminster; H. R. S. Harley, Guy's; G. D. Harthan, Manch.; W. H. Hayes, Bristol; A. G. Hemsley, Middlesex; Sylvia A. M. Herford, Roy. Free; A. G. W. Hill, Guy's; C. F. L. Hill, St. Mary's; W. A. T. Hill, Liverp.; C. C. Houghton, Birm.; W. Hughes and B. W. Hunt, Guy's; G. C. W. James, St. Thos.; Gwyneth M. Jenkyn-Owen, Roy. Free; R. A. Johnson, Guy's; A. C. Jones, Middlesex; H. W. E. Jones, Liverp.; P. P. Jonescu, St. Bart.'s; D. Joy and S. Kaufman, Univ. Coll.; F. P. Kay, Manch.; R. G. M. Keeling, St. Mary's; H. M. Kelsey, Guy's; A. S. Kerr, Liverp.; D. E. Kessler and F. B. Kiernander, St. Thos.; E. W. Knowles, Liverp.; J. W. Lacey, Camb. and Lond.; W. J. Latham, Lond.; S. A. H. Lesser, Camb. and St. Bart.'s; J. L. Lewis, Lond.; R. N. A. Leyton, Camb. and Westminster; Ethna W. Little, Liverp.; R. G. M. Longridge, Camb. and St. Thos.; J. F. Loutit, Melb. and Lond.; L. McAskie, St. Bart.'s; I. B. McCrae, Charing Cross; J. A. V. McCrea, Cardiff and Lond.; R. D. McDonald, Cape and Lond.; W. P. Mallinson, St. Thos.; J. A. Mansi, St. Bart.'s; S. Marinker, Middlesex; M. S. Marks, Glasg.; H. A. C. Mason, St. Thos.; Ivy Massick, Roy. Free; W. V. Maughan, Middlesex; G. B. Miller, Birm.; H. C. B. Milne, Camb. and Westminster; M. Mirsky, Charing Cross; A. G. Moore, St. Thos.; D. C. Moore, Manch.; C. R. Morison, St. Bart.'s; J. E. Morrish, St. Mary's; R. Mundy, St. Bart.'s; E. G. Murphy, Univ. Coll.; W. G. Murray-Browne, St. Thos.; F. L. E. Musgrove, Guy's; E. Nashid, Cairo and West Lond.; J. A. V. Nicoll, St. Bart.'s; B. P. Niyogi, Calcutta and West Lond.; Eleanor M. F. O'Donovan, Roy. Free; Maude A. Parfitt, Univ. Coll.; W. Parke, Liverp.; D. E. Parry, St. Mary's; D. N. Parry, St. Thos.; E. N. Pearlman, Middlesex; Nora M. Pettitt, Roy. Free; D. N. Philip, St. Bart.'s; W. M. Philip, Guy's; P. M. J. Phillips, King's Coll.; E. D. Pond, Charing Cross; Dorothy S. Pope, Roy. Free; H. L. Porter, St. Thos.; I. H. Premdas, St. Bart.'s; J. S. Price, Birm.; M. Price, King's Coll.; A. R. Pritchard, Liverp.; C. N. Pulvertaft, Camb. and St. Thos.; R. F. Raynes, St. Mary's; E. W. Rees, St. Thos.; Florence G. Richards, Birm.; K. E. O. Ringdahl, St. Bart.'s; C. G. Rob, St. Thos.; O. N. Roussel, Camb. and St. Thos.; Millicent I. Rowland, Roy. Free; C. Royle, Manch.; L. M. Rubein, Lond.; J. W. R. Sarkies, St. Thos.; M. Schalat, Lond.; G. E. B. Scott, Camb. and Univ. Coll.; P. G. Scott, Univ. Coll.; J. S. H. Scott, St. Mary's; J. A. Seymour-Jones, St. Thos.; N. S. Shtetinin, Manch.; A. R. Sibbald, Liverp.; R. G. Silver, Oxon and Middlesex; R. Solley, Camb. and Lond.; G. C. Steel, Middlesex; A. Stoller, Univ. Coll.; L. D. Stone, Manch.; F. J. E. Stuhl, Westminster; K. H. Sugden and R. H. A. Swain, St. Bart.'s; J. R. Sweeting, Univ. Coll.; R. N. Tattersall, Leeds; R. F. Townsend, Westminster; R. G. Tuke, St. Thos.; W. H. Valentine, Camb. and St. George's; G. J. van der Merwe, Guy's; T. van der Walt and C. S. van Heerden, Lond.; G. G. Waldin, St. Bart.'s; J. O. Walters, Univ. Coll.; J. H. Ward, Camb. and St. Bart.'s; C. P. Warren, Lond.; Norah E. Weatherhead, Roy. Free; S. Weinstock, Lond.; Elizabeth H. Western, King's Coll.; E. H. L. Wigram, St. Thos.; R. R. Willcox, St. Mary's; O. G. R. H. Williams, Westminster; H. L. L. Wilson, Leeds; J. D. Wilson, St. Bart.'s; Ursula W. Wood, Bristol; and G. F. Wright, St. Thos.

Royal College of Physicians of London

A Leverhulme research scholarship will shortly be awarded by the College for the investigation of "some problem of disease in any branch of medicine." Applications should reach the assistant registrar at the College, Pall Mall East, S.W. 1, before June 10th. Further particulars will be found in our advertisement columns.

Pharmaceutical Society

At a meeting of this society held on May 15th it was announced that as the leases of its present premises are coming to an end it has been decided to erect a new building. A freehold site in Brunswick-square was acquired by the society in 1929, and the estimated cost is £195,000.

Royal College of Surgeons of Edinburgh

At a meeting of the College, held May 15th, with Dr. A. H. H. Sinclair, the president, in the chair, the following candidates having passed the requisite examinations were admitted to the fellowship:—

Norman Stannus Gunning, M.B. Adelaide; John Alexander Baty, M.B. Edin.; Alan John Stuart Lawson Boyd, M.R.C.S. Eng.; William Huntly Chambers, M.D., Ontario; Robert Cochran, M.B. Glasg.; David Kenneth Crawford, M.B. Edin.; Howard Roderick Duval, M.D. Ontario; Henley Henderson Harrison, M.B. Sydney; Murray Hamilton Heycock, M.B., N.Z.; Ewen Alistair Jack, M.B. Edin.; Alexander Lewen Mackenzie, M.D. Toronto; David James MacRae, M.B. Edin.; Gerard Brendan Malone-Lee, M.R.C.S. Eng.; Thomas Love Masterson, M.D. St. Andrew's; Arthur Ralph Rex Mears, M.R.C.S. Eng.; Michael Robert Sheridan, M.B. Liverp.; Ian Scott Smillie, M.B. Edin.; and Ernest Thompson, M.R.C.S. Eng.

The following candidates received the higher dental diploma:—

R. D. Johnston, S. C. Scarsdale Brown, C. A. Palk, H. S. R. Sarson, and A. O. Sutcliffe.

Imperial Cancer Research Fund

Dr. William Ewart Gye, M.D. Edin., will succeed Dr. J. A. Murray, F.R.S., as director of the fund on the latter's retirement at the end of this year.

Dr. W. E. Gye was born in 1884 and educated at the Risly Latin School and the University of Edinburgh, where he qualified M.B. in 1912, taking the M.D. in 1913. As a student he won many prizes and scholarships, and immediately after qualifying joined the staff of the pathology department of the University of Edinburgh under Prof. J. Lorrain Smith. In 1913 Dr. Gye came to London to work in the laboratories of the Imperial Cancer Research Fund. In 1914 he joined the R.A.M.C. and served as a captain in France and Italy in charge of field laboratories and at the War Office. On demobilisation he returned to his post at the Imperial Cancer Research Fund for a few months, and in 1919 joined the staff of the Medical Research Council at the National Institute for Medical Research in Hampstead. His scientific publications in general pathology are mostly concerned with anaerobic infections and the ætiology of silicosis, and in cancer research with filtrable tumours.

The Silver Jubilee Exhibition

The exhibition, which will be open to the public on June 1st, will consist of illustrations of the work of local government for the past 25 years, and will probably include demonstrations by various classes of school-children. The public health department will have exhibits of equipment now and 25 years ago, and discourses on the great progress illustrated by the exhibition will be given.

The Ambulance Service on Jubilee Day

The number of casualties dealt with by the accidents section of the London Ambulance Service on May 6th was 244 in response to 230 calls, the highest recorded since the "great slide" of Dec. 21st, 1927, when London streets froze after rain and over 2000 casualties occurred within an hour or two. The average time in reaching cases from the time of call was 6·2 minutes, and this achievement was rendered possible by the new organisation which enables the number of available ambulances to be increased from 18 to 32 on emergency. The only serious case of delay was due to the congestion in Trafalgar-square.

Dr. Barnardo's Homes

At the annual general business meeting of Dr. Barnado's Homes National Incorporated Association held on May 15th, it was stated that 116,649 destitute boys and girls had entered the homes to Dec. 31st last. A total of 16,925 children and young people were dealt with during the year, and 1607 boys and girls and babies were admitted to the homes—1466 permanently and 147 temporarily. The number in residence at the end of the year was 8345. These homes, it is claimed, have no red tape and no waiting-list: the need of the child is the only consideration. The address of the Association is, 18, Stepney Causeway, London, E. 1.

Noise Abatement

The Prime Minister will open, on May 31st, at the Science Museum, South Kensington, a Noise Abatement Exhibition which is being arranged through the Anti-Noise League. The exhibition will remain open throughout the month of June from 10 A.M. to 6 P.M. daily, and will conclude with a conference. This begins with a reception at 3 P.M. on June 26th, when Lord Horder, chairman of the League, with Lady Horder, will receive the guests. At 4.15 Mr. Hore-Belisha, Minister of Transport, will take the chair for a discussion on sound and noise to be opened by Mr. G. W. C. Kaye, D.Sc. Meetings will be held at 11.30 A.M. and 3 P.M. on the two subsequent days, when the chairmen will be Mr. Geoffrey Shakespeare, M.P., Mr. W. Ormsby-Gore, M.P., Lord Halifax and Mr. H. G. Wells, and the speakers Mr. H. G. Strauss, Mr. Hope Bagenal, Sir Henry Richards, and Lord Horder. During the exhibition a special display of noise-resisting materials will be shown at the Building Centre, 158, New Bond-street, W. The exhibition itself will present a comprehensive survey of the problem of noise, and will contain among other things a demonstration house incorporating the latest architectural and building designs and materials for sound-proofing and sound absorption. Further information may be had from the general secretary, Anti-Noise League, 66, Victoria-street, S.W. 1.

University of London

At a meeting of the senate held on May 15th Dr. A. St. G. Huggett was appointed to the chair of physiology at St. Mary's Hospital medical school, and Mr. J. Paterson Ross to the chair of surgery at St. Bartholomew's Hospital medical college, both from Oct. 1st.

Dr. Huggett, who was born in 1897, was educated at Wimbledon College, the City of London School, and St. Thomas's Hospital medical school, where he won the senior entrance science scholarship. Qualifying in 1918 he saw active service in North Russia with the Royal Army Medical Corps, and returned in the following year to the physiological department at St. Thomas's. Here his employment was at first part-time, and from 1922 to 1925 he held a Beit research fellowship. From 1925 to 1930 he was whole-time demonstrator, and by the latter year had graduated as M.B., Ph.D., and D.Sc. of London University. Appointment to a lectureship at Leeds followed, and since 1931 he has been university reader in pharmacology there, while remaining a member of the physiology staff. He has examined for the universities of Leeds and Manchester, and for the Royal College of Surgeons. Of his original work, observations on secretin and other subjects were published in collaboration with Prof. J. Mellanby. For some years he has been particularly concerned with problems of fœtal respiration.

Mr. Ross, who is 40 years old, qualified M.R.C.S. Eng. from St. Bartholomew's Hospital in 1917 after a distinguished career as a student. He joined the medical branch of the Royal Navy immediately, and after demobilisation returned to posts as demonstrator in physiology and pathology, and house surgeon at St. Bartholomew's. In 1920 he won the university medal in the M.B. Lond., took the F.R.C.S. Eng. in 1922 and the M.S. Lond. in 1928. In 1931 he was awarded the Jacksonian prize of the Royal College of Surgeons, and became a Hunterian professor of the College, and in the same year was appointed assistant surgeon to St. Bartholomew's Hospital, assistant director of the surgical unit, and reader in surgery in the University of London, as well as assistant surgeon to the West End Hospital for Nervous Diseases. He spent some months as associate in surgery at the neurological clinic of the Peter Bent Brigham Hospital in Boston, U.S.A., working with Prof. Harvey Cushing. His contributions to surgical literature have been chiefly concerned with neurological surgery, and in 1934 he published jointly with Prof. G. E. Gask a book entitled "Surgery of the Sympathetic Nervous System."

The Dunn exhibition in physiology for 1935 was awarded to Mr. R. D. Blachford (Guy's Hospital medical school), and the Dunn exhibition in anatomy was divided between Mr. A. G. Apley and Mr. P. H. Wood (University College).

Sir Ernest Graham-Little was reappointed, and Prof. M. Greenwood, F.R.S., appointed, to the senate for the period 1935–39.

On May 27th, 29th, and 31st at University College Dr. William McDougall, F.R.S., professor of psychology in Duke University, New Columbia, will lecture on psycho-analysis and social psychology. The lectures will be at 5.30 P.M., and Prof. Charles Spearman, F.R.S., will take the chair at the first.

University of Leeds

On July 1st the hon. degree of LL.D. will be conferred on Dr. Walter Elliot, Minister of Agriculture, and the hon. degree of D.Sc. on Dr. Harvey Cushing, professor of neurology in Yale University, U.S.A.

Glasgow Post-Graduate Medical Association

This association has arranged for a general medical and surgical course to be held from August 19th to Sept. 13th. The mornings will be occupied with general medicine and surgical diagnosis and minor surgery at the Victoria Infirmary and in the Western Infirmary, while the afternoons will be spent in studying special subjects. Clinical assistantships are also available in some of the institutions taking part in the work of the association. Further information may be had from the secretary of the association at the University, Glasgow.

Middlesex Hospital Medical School Centenary

The 100th anniversary of the foundation of the Middlesex Hospital medical school is to be celebrated on Wednesday, July 24th. In the afternoon the prizes and Medals won during the session 1934–35 will be presented to students by the Chancellor of the University of London, and on the same day there will be a "scientific evening." Both ceremonies will be held at the Middlesex Hospital. The students' centenary ball is to be held at the Dorchester Hotel on July 25th.

The "refresher course" and annual dinner will be held as usual during the last few days of September, and early in October respectively.

Calls to the Bar

On May 15th Dr. Fred Grundy (Inner Temple) and Dr. J. L. Moir (Middle Temple) were called to the Bar.

A Netherlands Information Bureau

To promote relations between the British Empire and the Netherlands and her colonies, a Netherlands and Netherlands Indies Information Bureau has been established in London. Its address is Shell-Mex House, Strand, W.C.2.

National Temperance Hospital

The tenth annual Macalister lecture will be delivered at this hospital (Hampstead-road, London, N.W.) on Thursday, June 20th, at 9 P.M., when Mr. Herbert Paterson will speak on medicine and magic. Medical practitioners are invited to attend and bring friends.

Memorial to Sir Donald MacAlister

On May 5th a stained-glass window in the war memorial chapel of the University of Glasgow was dedicated to the memory of Sir Donald MacAlister, principal of the university from 1907 to 1929 and chancellor from 1929 to 1934. The window has been placed in the chapel by the university court.

British Science Guild

At the annual general meeting of this guild to be held on June 12th, at 4.30 P.M., a lecture on Gas Defence will be given by Mr. J. Davidson Pratt, F.I.C., secretary of the Association of British Chemical Manufacturers. The meeting will take place in the lecture theatre of the Royal Society of Arts, John-street, Adelphi, London, W.C. The address of the guild is 6, John-street.

West London Medico-Chirurgical Society

Prof. Edward Mellanby, F.R.S., secretary of the Medical Research Council, will deliver the Cavendish lecture of this society on Thursday, June 13th, at 8.30 P.M., at the Kensington Town Hall. He will speak on proper feeding as the first essential for good physique and health. There will be a reception at 8 P.M., and the annual conversazione and medical and surgical exhibition will follow the lecture.

Manchester Medical Society

The annual general meeting of this society was held on May 1st. In taking the chair, the new president, Dr. Arnold Gregory, spoke of the services of Dr. E. Bosdin Leech, the retiring president, and referred to the successful conclusion of the society's centenary year under his presidency. After Dr. T. H. Oliver had given a short appreciation of the untiring work of Dr. Leech on behalf of the society, a presentation was made to Dr. and Mrs. Leech. Dr. Spence read a paper on England during the Black Death.

Industrial Accidents and Diseases

A British committee has been formed in connexion with the seventh International Congress on Industrial Accidents and Diseases, to be held in Brussels from July 22nd to 27th. The members include Sir Thomas Oliver, M.D. (chairman); Dr. D. A. Coles; Dr. Gilbert Burnet; Prof. E. L. Collis, M.D.; Colonel Donald J. Mackintosh, M.B.; Prof. S. L. Cummins, M.D.; Prof. John Glaister, M.D.; Colonel P. S. Lelean, F.R.C.S.; Dr. C. S. Thomson; Dr. S. A. Henry; Dr. T. E. A. Stowell; Dr. S. W. Fisher; Dr. Philip Ellman; Dr. Ronald E. Lane; Dr. Howard E. Collier; Lieut.-General Sir Harold Fawcus, M.B.; Dr. J. D. Byrd; Dr. W. Seaman Bainbridge; and Dr. Henry G. Kessler.

Post-graduate Courses in Berlin

International medical post-graduate courses are to be held in Berlin on the following subjects: internal medicine (Sept. 2nd–14th); intrathoracic surgery (Sept. 2nd–6th); tuberculosis (Sept. 9th–14th); infectious diseases (Sept. 16th–21st); throat, nose, and ear (Sept. 30th–Oct. 12th); and eugenics (Oct. 7th–12th). Monthly courses in all the special departments of medical science, including practical work, will also be held. Particulars may be had from the information bureau of the Kaiserin Friedrich-Haus, Robert Koch-Platz 7, Berlin, N.W. 7.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY, May 27th.
Odontology. 8 P.M. (Royal College of Surgeons, Lincoln's Inn-fields, W.C.), Annual General Meeting. Sir Frank Colyer will show new specimens received in the Museum.
TUESDAY.
Medicine. 5 P.M., Annual General Meeting. Dr. C. C. Ungley: Parenteral Liver Therapy in Pernicious Anæmia and Subacute Combined Degeneration. Dr. G. G. Kayne: Use of Sanocrysin in Pulmonary Tuberculosis. Dr. Burgess Barnett: Hæmostatic Uses of Snake Venom.
WEDNESDAY.
Surgery. Provincial Meeting in Cardiff.
History of Medicine. 5 P.M., Dr. J. D. Comrie: Eighteenth Century English Medicine.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Thornhaugh-street, W.C.
Fever Hospital Medical Services Group.
FRIDAY, May 31st.—4.30 P.M., Dr. Murdoch McGregor, Dr. H. S. Banks, and Mr. T. B. Layton: Incidence and Management of Scarlet Fever Otitis.

BRITISH PSYCHOLOGICAL SOCIETY.
Medical Section.
WEDNESDAY, May 29th.—8.30 P.M. (11, Chandos-street, W.), Mr. P. E. Vernon: The Rorschach Inkblot Test in the Light of Recent Research.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, May 27th, to SATURDAY, June 1st.—MAUDSLEY HOSPITAL, Denmark-hill, S.E. Afternoon course in psychological medicine.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Afternoon course in dermatology. (Open to all.)—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Course in Gynæcology.—CITY OF LONDON HOSPITAL, Victoria Park, E. All-day course in Chest diseases.—LONDON LOCK HOSPITAL, Dean-street, W. Afternoon course in venereal diseases. Courses arranged by the Fellowship are open only to members and associates.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, May 27th.—10 A.M., Medical Wards, Skin Clinic. 11 A.M., Surgical Wards. 2 P.M., Surgical and Gynæcological Wards, Eye and Gynæcological Clinics. 4.15 P.M., Mr. Green-Armytage: Seven Obstetric Pillars.
TUESDAY.—10 A.M., Medical Wards. 11 A.M., Surgical Wards. 2 P.M., Throat Clinic. 4.15 P.M. Dr. Redvers Ironside: Diseases of the Sympathetic Nervous System.
WEDNESDAY.—10 A.M., Medical and Children's Wards, Children's Clinic. 2 P.M., Eye Clinic, Gynæcological Operations.
THURSDAY.—10 A.M., Neurological and Gynæcological Clinics. Noon, Fracture Clinic. 2 P.M., Genito-urinary and Eye Clinics. 3.45 P.M., Venereal Diseases.
FRIDAY.—10 A.M., Skin Clinic. Noon, Lecture on Treatment. 2 P.M., Throat Clinic. 4.15 P.M., Mr. Simpson-Smith: Lecture.
SATURDAY, JUNE 1st.—10 A.M., Surgical and Children's Clinics, Medical Wards.
Daily at 2 P.M., Operations, Medical and Surgical Clinics. The lectures at 4.15 P.M. are open to all medical practitioners without fee.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, S.W.
WEDNESDAY, May 29th.—4 P.M., Dr. W. J. O'Donovan: Skin Diseases and the Workmen's Compensation Act.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, May 30th.—2 P.M., Dr. W. J. Pearson: Pulmonary Tuberculosis. 3 P.M., Dr. W. W. Payne: Carbohydrate Metabolism: 2. Action of Insulin.
Out-patient Clinics daily at 10 A.M. and Ward Visits (except Wednesday) at 2 P.M.

UNIVERSITY OF LONDON.
MONDAY, May 27th, WEDNESDAY and FRIDAY.—5.30 P.M. (University College), Prof. William McDougall, F.R.S.: Psychoanalysis and Social Psychology.
TUESDAY, THURSDAY, and FRIDAY.—5.30 P.M. (King's College, Strand, W.C.), Dr. Daniel De Lange: The Head Problem in Chordates.

NATIONAL INSTITUTE OF INDUSTRIAL PSYCHOLOGY.
MONDAY, May 27th.—5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel-street, W.C.), Miss May Smith, D.Sc.: Temperamental Factor in Industry. (Last of three lectures.)

INSTITUTE OF MEDICAL PSYCHOLOGY, Malet-place, W.C.
WEDNESDAY, May 29th.—3 P.M., Dr. H. Crichton-Miller: Toxic Neurasthenia. 4.30 P.M., Dr. Cedric Shaw: Gastro-intestinal Syndromes.

LONDON SCHOOL OF DERMATOLOGY, 49, Leicester-square, W.C.
MONDAY, May 27th.—5 P.M., Dr. M. Sydney Thomson: Common Skin Diseases in Childhood.
TUESDAY.—5 P.M., Dr. H. W. Barber: Alopecia Areata, and Vitiligo.
WEDNESDAY.—5 P.M., Dr. J. A. Drake: Animal Parasites.
THURSDAY.—5 P.M., Dr. A. M. H. Gray: Sclerodermia and Allied Conditions.

INSTITUTE OF PATHOLOGY AND RESEARCH, St. Mary's Hospital, W.2.
THURSDAY, May 30th.—5 P.M., Dr. Ronald Canti: Cultivation of Living Tissue.

ROYAL INFIRMARY, Manchester.
TUESDAY, May 28th.—4.15 P.M., Dr. J. F. Wilkinson: Anæmia.
FRIDAY.—4.15 P.M., Dr. T. H. Oliver: Demonstration of Medical Cases.

UNIVERSITY OF BIRMINGHAM.
TUESDAY, May 28th.—3.30 P.M. (General Hospital), Mr. F. A. R. Stammers: Demonstration of Surgical Cases.
FRIDAY, May 31st.—3.30 P.M. (Queen's Hospital), Dr. O. Brenner: The Thyroid Gland and Heart Disease.

UNIVERSITY OF DURHAM COLLEGE OF MEDICINE.
SUNDAY, May 26th.—10.30 A.M. (Newcastle General Hospital), Prof. T. Beattie: Medical Ward Visit.

ROYAL INFIRMARY, Dundee.
THURSDAY, May 30th.—3.15 P.M., Mr. F. R. Brown: Surgery of the Sympathetic Nervous System. 4.15 P.M., Prof. Charteris: Recent Advances in Therapy which are likely to prove important.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, June 29th.—4.15 P.M. (Eye Infirmary), Dr. A. J. Ballantyne and Dr. S. Spence Meighan: Eye Cases.

Appointments

BURNHAM, CECIL, M.B., F.R.C.S. Edin., has been appointed Hon. Surgeon to the London Homœopathic Hospital.
DON, C. S. D., M.D. Aberd., M.R.C.P. Lond., Hon. Assistant Physician to the Manchester Royal Infirmary.
ELLISON, J. E., M.Ch. Dubl., F.R.C.S. Edin., Resident Surgical Officer at the Cardiff Royal Infirmary.
IRONSIDE, R. N., M.B. Aberd., M.R.C.P. Lond., Hon. Assistant Physician to the Hospital for Epilepsy and Paralysis, Maida Vale.
RUSSELL, A. S. DILL, M.B. Lond., Second Anæsthetist, London Lock Hospital.
SMYTH, MICHAEL, M.Ch. Irel., F.R.C.S. Eng., Hon. Assistant Surgeon to the London Homœopathic Hospital.
TOWNSLEY, N. J., M.B. Belf., Resident Surgical Officer at the Royal Manchester Children's Hospital.

Births, Marriages, and Deaths

BIRTHS

CROUCH.—On May 15th, at Welbeck-street, the wife of H. A. Crouch, O.B.E., M.C., M.R.C.S. Eng., Sudan Medical Service, of a son.
DURNO.—On May 15th, at Herne Hill, S.E., the wife of J. Fyvie Durno, M.B. Aberd., of a daughter.
EVANS.—On May 12th, at Devonshire-place, the wife of E. Stanley Evans, F.R.C.S. Eng., of Ascot, Berks, of a son.
FLOOD.—On May 16th, at Limpsfield, Surrey, the wife of Phillip Flood, M.R.C.S. Eng., of a daughter.
GRAHAM BRYCE.—On May 13th, at Didsbury, Manchester, the wife of Alexander Graham Bryce, F.R.C.S. Eng., of a son.
GROSE.—On May 20th, at Suffolk House, Stanmore, to Winifred (*née* Oliver), wife of Dr. G. N. Grose, of Edgware, of a son.
MACLEAN.—On May 12th, at Devonshire-place, the wife of Donald Maclean, M.B. Glasg., Harpenden, of a son.
WELCH.—On May 12th, at Biddenham Lodge, near Bedford, the wife of Cuthbert Gerald Welch, M.D. Lond., of a daughter.

MARRIAGES

BROMLEY—AVELING.—On May 18th, at All Saints' Church, Wetheringsett, Suffolk, James Wilfred Bromley, M.B. Camb., to Elizabeth, only daughter of Dr. L. B. Aveling, of Brockford, near Stowmarket.

DEATHS

BRITTAIN.—On May 18th, Percy Morgan Brittain, L.M.S.S.A., of Hatfield, Herts.
EWENS.—On May 13th, at Eastbourne, Henry Luther Ewens, M.D. Durh., aged 68 years.
HARPER.—On May 18th, Peter Harper, M.D. Aberd., of Ferme Park-road, Hornsey, N.
SCOTT.—On April 1st, at Melbourne, Bernard Charles Scott, M.R.C.S. Eng., eldest son of the late Rev. T. S. Scott, Vicar of Anerley, aged 74.
WILSON.—On May 19th, suddenly, at Romford-road, Manor Park, Essex, William Alexander Wilson, M.B., Ch.B. Glasg., aged 52.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

THE INFLUENCE OF FOOD ON CHILD-BEARING *

BY V. B. GREEN-ARMYTAGE, M.D. Brist., F.R.C.P. Lond., F.C.O.G.

GYNÆCOLOGICAL SURGEON TO THE WEST LONDON HOSPITAL, AND OBSTETRIC SURGEON, JEWISH MATERNITY HOSPITAL

MORE and more during recent years has it become manifest that the empirical knowledge and deductions of our forefathers were founded on sound scientific principles. For instance, take the recent work of biochemists, and particularly of Macomber, upon the physico-chemistry of sterility and abortion. It has been shown that vitamins E, A, and D are essential, and exist in every well-balanced diet because Nature is primarily concerned in the art of creation. It is therefore not without interest to read in the Books of Kings and Samuel no mean table of foodstuffs to remove what in the Bible is called "this reproach among men"; the diet recommended consisting of "wheat, barley, and meal, parched corn, beans, lentils, olives, honey, butter, sheep, and cheese of kine, with fatted fowl and fatted oxen and all the fruits of the field."

Moreover, we find in the Old Testament the first classical example of suggestion, coincidence, or enviable practice in the treatment of sterility, for we read "and Reuben, going out at the time of the wheat harvest found mandrakes which he brought to his mother Leah, and Jacob slept with Leah that night and she conceived, and later also Rachael conceived." The mandrake contains vitamin E and is our *Mandragora autumnalis*, which belongs to the solanaceæ and is an antispasmodic.

To some, such inference may appear fantastic; but I can assure them that many a time, both here and in the East, I have found that if you can correct the diet, either directly in the home or by change of scene, and will, at the same time, speed up metabolic "revs" (to use a mechanical term) by giving small doses of thyroid gland and iodine solution to both husband and wife for three months at least, your patient will become pregnant and remain so without abortion.

The exact mechanism we know not. My own view is that the thyroid speeds up every gland of internal secretion, and particularly the endometrium and chorion, which is thereby enabled to filter, or neutralise the effect of toxins or secretions which disturb carbohydrate metabolism, causing hypoglycæmia with decrease of the alkalinity of the blood and increase of blood pressure, damage to the renal glomeruli and hepatic lobules arising later with or without convulsions.

Time will show; but I think the pendulum of opinion is swinging towards the conclusion that the so-called toxæmia of pregnancy is primarily a pluriglandular endocrinal upset, and that most of the symptoms are due to toxins from the bowel which primarily injure the hypophysis. Hitherto the placenta has borne the brunt of blame.

Calcium

Much has been written in recent years of the calcium phosphorus content, and rightly so, for every fœtus is a parasite battening upon its mother for the formation of bone and teeth, &c. Indeed, dental calcification begins as early as the seventeenth week, but Nature prepares for this by commencing the formation of the fœtal thyroid and parathyroids about the twelfth week, their duty being the maintenance and control of calcium metabolism.

Abroad I have seen countless times during pregnancy, patients on the lowest rungs of the calcium-phosphorus ladder, representing osteomalacia, tetany, and fœtal rickets, whereas in England one encounters cases on the middle or higher rungs which, because not thought of, are not so easy to diagnose. Minor degrees of pregnancy acalcæmia are ever with us in this great city. In some, the main stress is in youth, the back and pelvic girdle showing it in the form of scoliosis, lordosis, and descent of the promontory. If such women marry, delivery may demand surgical assistance or necessitate mutilative operations. In others, without any symptoms whatever, owing to softness of the bones and the weight of the body, at the second dentition or puberty, the pelvis may assume the android or funnel type, with lessening of the sub-pubic angle and great contraction of the outlet.

Let me recall the case of a patient who went from Bradford to marry in India. To all appearances she was a strong, strapping, Yorkshire girl. She went into labour. Her doctor was quite comfortable as regards her usual measurements and the relation of the fœtal head to the inlet; but he forgot—or perhaps it would be better to say he had not been taught—to pay attention to the outlet measurement. After the head had been on the perineum for some hours, he tried to apply forceps and could not. He then did a craniotomy. She developed puerperal septicæmia and was sent to my isolation block, where she died. Had she been measured, or had it been realised that a diet deficient in youth can produce symptomless bony deformity at the outlet only, this disaster could have been avoided by Cæsarean section.

Take another condition as common in private as in hospital practice—the flabby uterine wall associated, with a flabby abdominal wall and flabby cardiac wall. Here we have a condition producing a syndrome of peculiar risk—namely, malpresentation, uterine inertia, retained placenta, post-partum hæmorrhage, and obstetric shock. (I do not include inversion, because it is so rare.)

Any or all of these may be found in the anæmic, acalcæmic woman who has been watched through pregnancy with an unseeing eye; for "without vision the people perish."

Endocrine Factors

It is one of the paradoxes of Nature that it is the multipara who suffers most. They are not often like the well-fed Hebrew women, in the book of Exodus—"brisk creatures delivered before ever a midwife reaches them" (Moffatt)—but are like the wife of Phinehas in the book of Samuel, who big with child bowed herself and fell in labour; and when she was on the point of death they that stood about her said, "Fear not for thou hast born a son. But she answered not, neither did she regard it." These are signs and symptoms of clinical importance which compel attention and drive home the maxim that the "vitamins are to the endocrines what the endocrines are to the economy"; for by correct feeding, sunshine, and exercise, disaster may be obviated.

Modern biochemistry and the pathology of the living indicate that many of the tragedies of pregnancy are due to deficiency or excess of the endocrine glands associated with dietetic errors. For a long while we have known that the thyroid gland hypertrophies, and now we know that the adrenals and pituitary do likewise, obviously for the maintenance of equilibrium. If, however, normal metabolic function should be disturbed, glandular dystrophy will manifest itself. For instance, excess of posterior pituitary secretion, associated with imbalance of the thyroid and parathyroids, causes hæmorrhages, hyperexcitability, high blood pressure and flabby uterine wall, flabby heart wall, and hyperglycæmia.

The whole subject is one of intense interest, and it is the close relation of the endocrine system to the food intake that makes antenatal care so important, because only by keeping this view constantly in mind

* A post-graduate opening address delivered at the West London Hospital on March 11th.

are we able to detect any deviation from the normal as regards blood pressure, urine, reflexes, and blood changes. The trend of modern opinion being that such substances as guanidine, histamine, and/or histidine (the breakdown products of vitiated function) are absorbed and give rise to their effects via the endocrine system. It is probable that this view is not far-fetched, for anyone who has ever seen a case of colubrine snake poisoning will agree that the effects of such injected poison are similar to those of the toxæmia of pregnancy. Such effects as hypoglycæmia, the increase of blood ketones and amines, the rise in blood pressure, the cyanosis, the œdema, the reno-hepatic damage and, finally, the convulsions, could not occur so rapidly unless the poison acted through or upon the pituitary gland.

I am perfectly aware that there is a tendency to overdo antenatal care, but while modern urban life is so far removed from Nature and while coroners and newspapers and, what Shakespeare called "long-tongued, babbling gossips," exist, it is better to be careful rather than careless. Moreover, for those who deride, it is interesting to remember that so long ago as Genesis, the hyperexcitability of acalcæmia and hypothyroidism in the primipara was observed; for it is written that "Isaac besought the Lord for his wife because she was barren and He heard him. And after a time the children struggled in her womb and she was afraid and said, 'If it were to be so with me what need is there to conceive.'" Even in those days, therefore, tumultuous movements of the fœtus, usually associated with hypoglycæmia and lack of calcium, were known to anticipate miscarriage or premature delivery. Just as to-day we recognise that deficiency of vitamin D and C in the diet, and consequent deficiency of calcium and phosphorus during pregnancy, spell gingivitis, dental caries, muscular weakness, spasmodic cramps in the legs or arms, tachycardia, and tetany. Moreover, time will probably show that diet and pluriglandular dystrophy are associated with, or responsible for, diminution of the folliculin-producing principle in the ovary and placenta, which controls spontaneous contraction and the termination of gestation, and thereby lead in some cases to prematurity or pathological post-maturity.

Anæmia

So far, I have endeavoured to present a reasonable explanation for some of the major disabilities of pregnancy and parturition and have tried to show how many of the tragedies of childbearing are bound up with the abuse of natural food, and urban methods of living—Providence hurling the thunderbolt when endocrine function reaches its limit.

It now remains for us to deal with a lesser but no less important condition—that of the anæmias of pregnancy.

There are six different groups of anæmia of pregnancy, but I need not speak of those types which are associated with hæmolytic streptococci in the blood, or of that which is the sequence of postpartum hæmorrhage, or of that large group which is accompanied by disease of the spleen, lymph-glands, or marrow. But rather I want to remind you of those three common groups which are frequently met in practice.

The first is not very serious and is a condition of hydræmia which is associated with mild anæmia and œdema of the limbs and is due to the fact that the food supply is insufficient in those substances which equilibrilise the normal strain of pregnancy—substances which are found in all good diets—namely, calcium, iron, manganese, and copper. These cases are readily curable.

The second type is more insidious and is often met with in cases where there has been vomiting and much constipation in the early months and where the diet has long been poor, or is at the moment deficient, in those specific substances necessary for hæmopoiesis—namely, protein, fruits, and green vegetables. Moreover, it has been shown by Castle that these women have hypochlorhydria or achlorhydria accompanied with reduction or inactivity of the gastric enzyme. A blood picture shows hypochromia with marked reduction in hæmoglobin but a less marked diminution of red blood-cells. The red cells are small and vary in shape. Normoblasts may be present but megalocytes are not seen. There is a slight relative leucocytosis. If treatment is not actively instituted these changes rapidly progress and are accompanied by great prostration, dyspnœa, and œdema. Albuminuria is occasionally present and in the untreated patient miscarriage is by no means uncommon.

It used to be thought that this progressive anæmia was due to a placental toxin or bone-marrow disease, but now that we know that there is a reduction in the free HCl and total acidity of the gastric juice we realise that this type of anæmia is due to a diminution of hæmoglobin-building materials in the food together with a lessened ability to utilise such materials after ingestion. Moreover, when it is remembered that every fœtus in utero is a parasite, and in this particular type of case is born at term with a normal blood count and a liver fully stored with iron, copper, zinc, and so on, it will be understood that the demand of the fœtus for such hæmoglobin-building materials has been at the expense of its parent and is exactly comparable in its effect upon the hypochlorhydric mother, as visible and repeated blood losses would be. This being so, the outlook is good provided the clinical condition has been early recognised, for the treatment is mainly by sunlight, diet, and the provision of food containing those intrinsic and extrinsic factors in proteins, vegetables, and fruits, which stimulate hæmopoiesis. Liver in some form being also essential. Iron is given in the form of fresh Blaud's mass, grs. 90 per day, together with well-diluted hydrochloric acid.

The last type is the most grave from the patient's and practitioner's point of view and resembles Addison's pernicious anæmia. It is due to deficiency of Castle's extrinsic factor in the diet or lack of his intrinsic hæmatinic principle in the stomach and intestine. These patients have a waxy appearance and often there is a daily rise of fever and enlargement of the spleen which may simulate typhoid. The tongue is sore and in some patients retinal changes occur. Œdema and albuminuria are often present but rarely is there hypochlorhydria or achlorhydria. The blood picture shows a colour-index above 1 and much variation in the shape and size of the red blood-cells. Megalocytes are always present which means a pathological proliferation of megaloblasts in the bone marrow.

This type of anæmia is rare in England, but may be seen in patients who have come from the tropics to reside in London; for megalocytic anæmia is extremely common in the tropics and frequently accompanies sprue, dysentery, or parasitic infections of the bowel.

During pregnancy, or immediately after it, this type of anæmia may be fatal if it has not been recognised and treated adequately. Fortunately for us and the people of the tropics, the brilliant research work of Miss Lucy Wills has given us almost a specific method of treatment; for she has shown that whereas many of these cases react excellently to liver-ventriculin treatment on the intrinsic principle of Castle, others fail to do so because they lack that extrinsic factor (vitamin-B complex) in their diet which stimulates reticulocyte response. Such response can be assured and recovery made certain by giving Marmite ½ to 1 oz. per diem in addition to the usual dietetic measures, with or without repeated small blood transfusions. Marmite is an autolysed extract made from brewer's yeast and is probably a protein breakdown product.

The Useful Foods

So far I have spoken much of diet but have given no detail. Perhaps, therefore, I may be permitted to enumerate those food substances which particularly contain iron, copper, and manganese, together with the vitamins A, B, C, D, and E. They are: Asparagus,

almonds, beef (lean), beans (kidney), barley, carrots, cheese, eggs (yolk), green vegetables (especially lettuce and spinach), liver, oatmeal, oysters, peas, peanuts, potatoes, prunes, raisins, walnuts, and wheat. Milk and fruit, such as apples, bananas, oranges, and grape-fruit, contrary to the general lay view, contain these metals in infinitesimal quantities. One pint of good raw milk contains 10 grains of calcium and nearly an ounce each of fat and protein, and 7 ounces of fresh protein contains 3 grains of calcium only. But every fœtus after the fifth month needs that quantity of calcium per day. So the mother must eat for two in order to maintain her calcium balance and mineral needs.

Here I should like to refer to the importance of Prof. E. Mellanby's work in the prevention of puerperal sepsis. As you know, by experiment in the septic isolation block at Sheffield, he was able to demonstrate that the concentrated exhibition of vitamin A preparations was capable of diminishing the mortality in septicæmia. This observation has not been fully corroborated, but there seems little doubt that if the antenatal patient is fed properly with foodstuffs or preparations containing vitamin A, she is less likely to develop septic complications after labour, the probability being that vitamin A is provided in food by Nature, to raise the resistance or surface tension of the epithelium to invasion by organisms. My own experience fully bears this out and I am sure that practitioners who often have to work under conditions far from ideal, would do well, not only to diet, but throughout pregnancy to prescribe one of the many vitamin A and D preparations on the market.

Finally, let me say something of the importance of diet in the postnatal period; for quite apart from its importance to the nursing mother and infant, we must remember that involution and repair has to occur in the muscles, bones, and joints, as well as in the uterus. Many of the postnatal aches and pains in the back and pelvic girdle are due to continued laxity of ligaments and cartilage which should not persist. Many of these symptoms are due to the fact that the fœtus is still draining the mother of calcium, phosphorus, &c., which she should make good in her diet; but it is more than probable that in many cases from poverty, lack of sunshine, and debility, the mother is incapable of doing this.

It is possible that many cases of one-child sterility are due to the mother remaining an invalid on a deficient diet after pregnancy; the defect in minerals reacting upon the hypophysis and ovary.

COMMITTEE AGAINST MALNUTRITION

AT a public meeting held in London on May 16th, under the auspices of this committee, Prof. V. H. Mottram, who presided, remarked that people seem to think that malnutrition is a definite state, whereas he would suggest that any nutrition falling below the optimum is malnutrition. Mr. Joseph Needham, D.Sc., reader in biochemistry in the University of Cambridge, mentioned investigations which showed that, whereas a group of good-class public school-children gave 50 per cent. as in the highest category for health, a poor elementary school gave only 9·6 per cent., and an elementary school in an area with severe unemployment 6 per cent. A further inquiry had shown that a group of public school boys were on the average 20 lb. heavier than a group of boys of the same age in poor schools. Miss Eleanor Rathbone, M.P., contended that it was unfair to place upon the working housewife the responsibility for malnutrition; that her "ignorance" played but a small part was shown in recent surveys—e.g., on Merseyside. If the working housewife spent little on milk, vegetables, and fruit, it was because she could not afford it. In the maldistribution of wealth unfair taxation played a part; again, wages and salaries took no account of family responsibilities. There was now, said Miss Rathbone, an opportunity of making two needs fit into each other—the need of the ill-fed and the need of the agricultural industry. About three million school-children now received a third of a pint of milk cheap on school days. If more money were granted, this service could be extended to the other three million school-children (not only on school days but on holidays as well) and to the children under school age and their mothers. She believed also that there was a strong case for providing one free meal a day for all elementary school-children, and to all secondary school-children under a suitable means test. Dr. Janet Vaughan said that half the patients that came to her out-patients' clinic suffered from diseases which could have been prevented if they had had the right food. There was a campaign for curing "incurable" diseases like cancer; why not a campaign for curing the diseases for which the cure was known, the deficiency diseases? Dr. J. R. Marrack, university professor of chemical pathology at the London Hospital, spoke of diseases not directly but indirectly due to inadequate food. Children with rickets, for example, were more likely to die from pneumonia, whooping-cough, and bronchitis—the main causes of death among young children—while from anæmia one would find increased incidences of other diseases such as pneumonia and diarrhœa. The increase of tuberculosis in neutral countries during the late war could only, in his opinion, be accounted for by food deficiencies. Leprosy in some parts of India attacked 12 per cent. of the people; and there was now little doubt that leprosy was closely associated with food deficiency. Prof. Marrack mentioned that the tuberculosis death-rate among young women between 20 and 30 in Calcutta was nearly as high as the total death-rate in New Zealand from all causes.

NEW PREPARATIONS

STAPHYLOCOCCUS TOXOID A AND B.—We have received from Messrs. Burroughs Wellcome and Co., Snow Hill-buildings, London, E.C., samples of two preparations to be used for active immunisation: "Wellcome" Brand Staphylococcus Toxoid A (1/10 dilution), and Staphylococcus Toxoid B (undiluted toxoid), each in containers of 1 c.cm. Immunisation with staphylococcus toxoid has been used recently as a combined method of prophylaxis against, and treatment of, chronic infections. Promising results have been reported from Melbourne and Toronto in such conditions as recurring boils, carbuncles, acne, sycosis, and blepharitis. English experience appears to be not yet large, but the results, obtained mainly during the course of an investigation by the Therapeutic Trials Committee of the Medical Research Council, agree with those reported from Australia and Canada. The investigation of the M.R.C. Committee was carried out with staphylococcus toxoid supplied by the Wellcome Physiological Research Laboratories. In a considerable number of patients "cure" has been obtained; in many "improvement"; and in a small number "no improvement." There are on record, it is frankly admitted, instances of puzzling relapses in patients who had shown rapid disappearance of long-standing symptoms—a phenomenon which further experience may explain and perhaps obviate.

PROGESTIN (B.D.H.).—The corpus luteum secretes a hormone, progestin, the secretion being responsible for the control of many of the phenomena of pregnancy and menstruation. We have received from British Drug Houses Ltd. (Graham-street, City-road, London, N.) a sample of progestin distributed by the firm. Progestin (B.D.H.) is a preparation of the hormone standardised for its proliferational activity in the immature rabbit uterus previously treated with œstrin. The manufacturers have evidence that it should be of value especially in the functional disorders of pregnancy and menstruation. The drug is to be injected intramuscularly, for which purpose it is issued in ampoules, the contents of which may be found on examination to be turbid. This turbidity can be removed by warming, and in

all events it is recommended to place the ampoule in warm water before transferring the contents to a syringe, which should have a strong needle, at least 2 in. in length and of sufficient diameter to allow free passage of the oily solution. A circular issued by the firm with the preparation claims that complete absence of menstruation or a scanty menstrual flow may be treated with advantage with a mixture of œstrin and the corpus luteum hormone.

FERRO-"HEPAMULT."—Messrs. H. R. Napp Ltd., 3 and 4, Clements-inn, London, W.C., send us a brochure in explanation of their new product Ferro-"Hepamult," together with a sample of the preparation. This consists of the active principles of liver, which last year the firm introduced to the medical profession under the name "Hepamult" (v. THE LANCET, 1934, ii., 342), together with an assimilable ferrous salt. It is standardised in the proportion of 10 g. "Hepamult" (equals 8 oz. fresh liver) to 1·7 g. iron, that quantity being the average daily dose. Ferro-"Hepamult" is intended for the treatment of anæmias, and should find favour with practitioners, as a combination of liver and iron treatment in anæmic conditions is very generally recognised as valuable. Ferro-"Hepamult" is presented in the form of palatable sugar-coated granules carefully tested and standardised, while the iron content is in the form of a stable ferrous salt ensuring ready absorption and absence of intestinal irritation.

BENGAL MEDICAL COLLEGE CENTENARY VOLUME.—This may be obtained from the secretary of the subcommittee, Dr. A. C. Ukil, Medical College, Calcutta.

Vacancies

For further information refer to the advertisement columns

Aberdeen Royal Infirmary.—Two Hon. Clin. Tutors.
Accrington, Victoria Hospital.—H.S. £150.
Albert Dock Hospital, Connaught-road, S.E.—Res. M.O. At rate of £110.
All Saints' Hospital, Austral-street, S.E.—Res. H.S. At rate of £100.
Bath, Royal United Hospital.—Hon. Surg. for Ear, Nose, and Throat Dept., and Hon. Med. Reg.
Beckenham, Bethlem Royal Hospital, Monks Orchard.—Radiologist. 150 guineas.
Bedford County Hospital.—First and Second H.S. At rate of £155 and £150 respectively.
Belfast, Royal Maternity Hospital.—Res. M.O. At rate of £26.
Birmingham, Selly Oak Hospital.—Res. Physician. £650.
Bolton Royal Infirmary.—Two H.S.'s. Each £125.
Bournemouth, Royal National Sanatorium for Consumption, &c.—Consulting Phys.
Bradford, Grassington Sanatorium.—Asst Res. M.O. £175.
Brentwood, Essex County Mental Hospital.—Jun. Asst. M.O. £510.
Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £120.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
Canterbury, Kent and Canterbury Hospital.—Two H.S.'s. Each at rate of £125.
Carshalton, &c., District Hospital.—Two Hon. M.O.'s.
Charing Cross Hospital, W.C.—Asst. Physician.
Chelsea Hospital for Women, Arthur-street, S.W.—Jun. H.S. At rate of £100.
Cheltenham General and Eye Hospitals.—H.P. £200.
Connaught Hospital, Walthamstow, E.—H.S. At rate of £100.
Coventry and Warwickshire Hospital.—H.S. for Aural and Ophth. Depts. At rate of £125.
Downpatrick, Down Mental Hospital.—Res. Med. Supt. £800. Also Asst. M.O. £350.
Dreadnought Hospital, Greenwich.—Hon. Gynæcologist. Also H.P. and H.S. Each at rate of £110.
Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Clin. Asst. to Ear, Nose, and Throat Dept. Also H.P., three H.S.'s, and Obstet. Asst. Each at rate of £50.
Evelina Hospital for Sick Children, Southwark, S.E.—H.P. At rate of £120.
Gateshead Mental Hospital.—Med. Supt. £800. Also Asst. M.O. £400.
Glasgow University.—St. Mungo Chair of Surgery.
Hartlepools Hospital.—H.S. At rate of £150.
Hastings, Royal East Sussex Hospital.—Jun. H.S. At rate of £150.
Hertford County Hospital.—Sen. H.S. At rate of £200.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Asst. for Dept. of Pathology. £350. Also Asst. Physician.
Hospital for Tropical Diseases, Gordon-street, W.C.—Two H.P.'s. Each at rate of £120.
Hospital for Women, Soho-square, W.—Res. M.O. At rate of £100.
Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.
Hull Royal Infirmary.—Cas. O. At rate of £150.
Indian Medical Service.—Commissions.
Ipswich, East Suffolk and Ipswich Hospital.—H.P. £120.
Iraq Government.—Appointments. Each £100–£120 per mensem.
Jersey General Hospital and Poor Law Infirmary.—Res. M.O. £100–£200.
King George Hospital, Ilford.—Res. Surg. O. and Res. Asst. Surg. O. £300 and £250 respectively. Also Two H.P.'s and Three H.S.'s. Each at rate of £100.
Leicester Royal Infirmary.—H.S. At rate of £125.
Leicestershire and Rutland Mental Hospital, Narborough.—Asst. M.O. £350.
Liverpool, Stanley Hospital.—Hon. Asst. Surgeon.
London Hospital, E.—Physician. Also Surgeon.
Lucknow University.—Prof. of Medicine. Rs.900/- per mensem.
Macclesfield General Infirmary.—Second H.S. At rate of £150.
Maidstone, West Kent General Hospital.—H.S. £150.
Manchester Ear Hospital.—Res. H.S. £120.
Manchester Royal Infirmary.—Res. Clin. Pathologist. £100.
Metropolitan Water Board, Rosebery-avenue, E.C.—Chief M.O.
Middlesbrough, North Riding Infirmary.—Third H.S. At rate of £125.
Mid-Wales Counties Mental Hospital, Talgarth, Breconshire.—Asst. M.O. £400.
Newcastle-upon-Tyne, Royal Victoria Infirmary, &c.—Temp. Asst. in Pathological Dept. £400–£600.
Newport, Isle of Wight County Mental Hospital.—Clin. Asst. 30 guineas.
Norwich City.—Asst. M.O.H. and Asst. School M.O. £500.
Paddington Hospital, Harrow-road, W.—Res. Med. Supt. £1100.
Preston, Sharoe Green Hospital.—Sen. Asst. Res. M.O. At rate of £150.
Princess Elizabeth of York Hospital for Children, E.—H.P. and H.S. Each at rate of £125.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Registrar. 20 guineas.
Queen Mary's Hospital for the East End, E.—Res. M.O. and Two Cas. O.'s. Each £150. Also Two H.S.'s., H.P., Obstet. H.S., and Res. Anæsthetist. Each £120.
Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100.
Romilly Lodge for Mentally Defectives, Hornsey Rise, N.—Part-time M.O. At rate of £40.
Ross Institute of Tropical Hygiene, Keppel-street, W.—M.O.'s.
Royal College of Physicians of London.—Leverhulme Research Scholarship. £500.
Royal Free Hospital, Gray's Inn-road, W.C.—Res. Cas. O. At rate of £150. Also First H.S. and Res. Anæsthetist.
Royal Masonic Hospital, Ravenscourt Park, W.—Res. Surg. O. At rate of £250.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. £200. Also H.S. At rate of £100.
Ryde, Royal Isle of Wight County Hospital.—Res. H.S. At rate of £180.
St. George's Hospital, S.W.—Asst. Physician.
Salvation Army, Mother's Hospital, Lower Clapton-road, N.—Jun. Res. M.O. At rate of £80.
Sheffield, Jessop Hospital for Women.—Three H.S.'s. Each at rate of £100.
Sheffield Royal Hospital.—Clin. Asst. to Ear, Nose, and Throat Dept. £300.
Sheffield Royal Infirmary and Royal Hospital.—Clin. Asst. £300.
Sheffield University.—Asst. Pathologist and Demonstrator. £500. Also Lecturer in Bacteriology. £600.
Southend-on-Sea General Hospital.—Med. Reg. £300. Surg. Reg. £250.
Stockport Infirmary.—Res. Surg. O. £250.
Surrey County Council.—Two Asst. M.O.'s. Each £600.
Warwick, King Edward VII. Memorial Sanatorium, Hertford-hill. Jun. Asst. M.O. At rate of £200.
Watford and District Peace Memorial Hospital.—H.S. At rate of £150.
West Bromwich and District General Hospital.—H.P. At rate of £200.
West London Hospital, Hammersmith-road, W.—Chief Clin. Asst. in X Ray Dept. £125. Cas. O. £250. Also H.P. and 2 H.S.'s. Each at rate of £100.
Winchester, Royal Hampshire County Hospital.—H.S. At rate of £125.
Wolverhampton and Midland Counties Eye Infirmary.—H.S. £150.
Worksop, Victoria Hospital.—Two Residents. At rate of £150 and £120 respectively.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Castle Hedingham, Essex.

Medical Referee under the Workmen's Compensation Act, 1925, for the Ashby-de-la-Zouch and Loughborough County Court Districts (Circuit No. 20). Applications should be addressed to the Private Secretary, Home Office, Whitehall, London, S.W.1, before June 12th.

CHISWICK GENERAL HOSPITAL.—The old house on Chiswick Mall, which the late Mr. Dan Mason gave to be used as Chiswick Hospital, is to be demolished and a new hospital is to be erected on the same site. No appeal will be made to the public for funds for rebuilding, and there will be accommodation for 14 men, 14 women, and 10 children.